Vol. IV. MARCH, 1920. No. 3.

THE
Madras Forest College Magazine.

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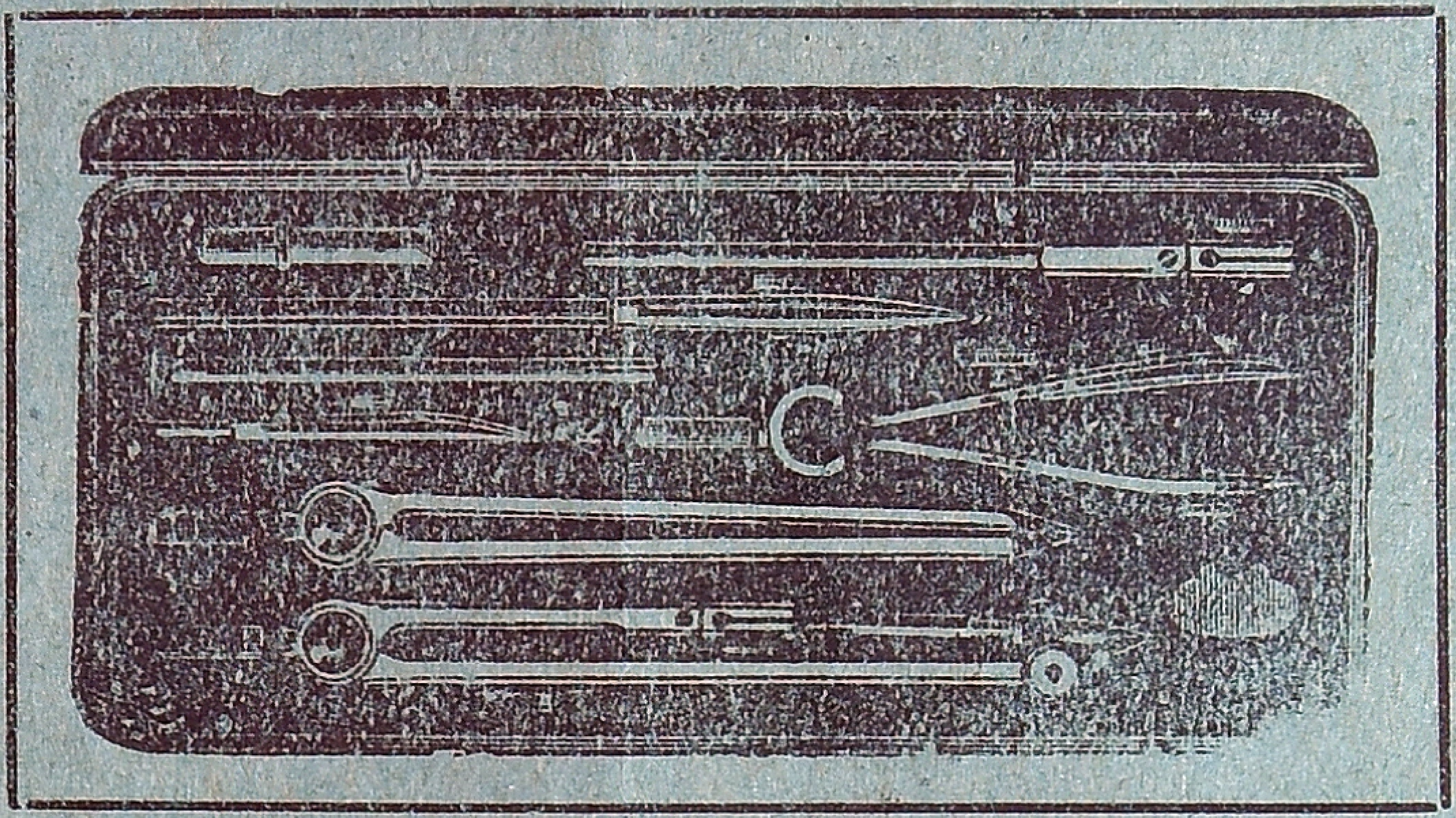

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His Excellency Lord Willingdon with the Board of Visitors, Staff, and Students, of the Madras Forest College, September 1919.

The Madras Forest College Magazine.

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CONTENTS.

PAGE.

1. A Short History of the Madras Forest College, Ornamental Park, Plantations and gardens. 1
2. Under planting in Nilambur. 12
3. Sandalwood Observation Areas. 14
4. Extracts from "Forests and Gardens of South India" by Dr. Cleghorn published in 1861. 18
5. Extracts from "Forestry in Southern India" 45
6. The Senior and Junior Division tour. 68
7. A pleasant evening at Kargudi. 72
8. The Elephant capture in Mudumalai Range 74
9. Notes on some exotics. 79
10. Occasional Notes. 81
11. Miscellanea. 84
12. List of books received for the College Library during the quarter ending December 1919. 86
13. Contributions to the Gass Museum 88
14. Advertisements. 89
15. Gazette Notifications. 92

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THE

Madras Forest College Magazine.

Published Quarterly.

Vol. IV. March 1920. No. 3.

A Short History of the Madras Forest College, Ornamental Park, Plantations and gardens.

The earliest official record of the inception of the Madras Forest College is to be found in a letter dated 11th December 1907 from Mr. F. A. Lodge, Conservator of Forests at Coimbatore. It had been decided to construct there a special building for the Forest School for training Deputy Rangers and Foresters that had for some years previously been of excellent service to the Department in spite of the very limited quarters and equipment available for it in the compound of the Conservator's Office. In connection with this proposal Mr. Lodge urged that the opportunity should be taken to convert this school into a College for the Ranger class and for this purpose to construct a suitable and appropriate building near the Agricultural College 3 miles north of Coimbatore. These proposals had to pass through the usual official scrutiny for a considerable period and various modifications were suggested.

Short History of the origin of the Madras Forest College.

In June 1909 the Board proposed and a G. O. was subsequently issued to the effect that the vacant buildings of the Agricultural College at Saidapet should be temporarily utilised for the Forest College and a commencement should be made.

In 1910 the Bombay Government wanted that Bombay students should be trained at Coimbatore and suggested that instead of Coimbatore, Dharwar should be the site of the South Indian Forest College. The first proposal was protested against by the Conservators (Messrs. Brasier and Lodge.) The 2nd proposal was opposed by Messrs. Lodge, Peake and P. M. Lushington. In 1911 it was finally decided by the Government to locate the Forest College at Coimbatore. An area of 197. 76 acres was acquired. The foundation stone for the Forest College was laid by His Excellency Lord Pentaland on 9—4—1913. The construction was more or less finished in 2½ years and opening ceremony was made by His Excellency Lord Pentland on 14–10–1915.

Description of the site.

The whole area of the College Estate is black cotton soil. The depth of black cotton varies for 3 to 6 feet and the sub soil is disintegrated soft rock. The whole area was under dry cultivation, an annual crop of either Cholum, cotton, thenai or Bengal gram being raised by the ryots; the harvest entirely depended upon the monsoon. There were practically no wells or garden cultivation. The only well that existed in the area was a small dilapidated one east of the present museum site but the water in the well was said to be very brackish and was not used at all. The Public Works Department closed this well and had another sunk at the North east corner of the area. This well was the source of water supply for the contractor of all buildings and was supplemented from time to time from the Kumaraswami tank about a mile Southwest of the site. The water from the tank was worked with an oil engine for about 6 months when the tanks contained water.

The well sunk by the Public Works Department was the source of water supply in the estate in the earlier days and continues to be the only source up to the present day for garden purposes. The well is about 75′ deep and contains a perennial supply of water. In the interval between 1911 and September 1915, when the College buildings were finally occupied by the students and staff, the area was more or less grazed over by village cattle. Goats played an important part. These animals which are destructive to forest growth were most useful in dropping dung full ot Acacia arabica seeds. A spontaneous growth of Acacia arabica seedlings came up on the whole of the area. These seedlings established themselves and are now growing into big sized trees.

Planting operations.

As soon as the well at the North east corner was sunk by Public Works Department a nursery about 2 acres in extent was laid out in 1912 near the well. Red earth was imported and mixed with black cotton for improving the soil. Plants were raised in the nursery. These were mostly used for the wind belt on the western boundary of the Estate and avenues for roads. At one time the planting operations for avenues were to be entrusted to Public Works Department but Mr. Richmond suggested to the Board in his No. 549 of 1913 dated 23—9—1913 as quoted below:—

"With reference to B. P. F. No. 803/Routine dated 17-9-1913 I have the honour to respectfully suggest that the Principal and Instructors of this College, who are Forest Officers are more capable of preparing and carrying out an estimate for planting trees &c., than the Officers of the Public Works Department."

The control and carrying out of the planting work in the College estate were then looked after by the Forest Officers at the College as at the beginning of the Scheme.

The following extracts from the Administration reports regarding the College Estate are of great interest :—

1912—13.

From every point of view it is a serious misfortune that the new site consists wholly of black cotton soil. The cost of the Arboretum, athletic ground and road-works, as a consequence, must be exceptionally high as regards both capital and maintenance charges. Under the supervision of the Imperial Instructor and Second Provincial Instructor experiments are being undertaken to ascertain what combination of artificial top soil over the pure black cotton will yield the best practical surface for the Athletic ground.

1915—16.

The menial staff is far from satisfactory and its members take every advantage of the lack of control during the absence of all authority when the staff is on tour. The low pay coupled with the situation of the College far removed from the "bazaar" gives no hope of any improvement in the future.

This holds good practically with regard to the care and improvement of the grounds and arboretum. During the absence of the staff on tour the gardeners grossly neglected the avenue and hedge plants and a large number of them died. Being low paid posts no skilled gardeners can be employed and for want of immediate supervision every operation is done in a wrong and negligent manner. The pruning of avenue trees cannot be left to them and what has been done so far has been done in person by the Principal and his wife. [Mr & Mrs. Fischer] So long as this state of things continues the College Estate must continue to present the appearance of desolate waste which is in no way toned down by the building rubbish left here and there by the Public Works Department. A further difficulty is want of water. The present well and Engine can only just meet the requirements of the staff and the students during hot weather so that the supply from this source for watering purposes has to be cut off just at the time when it is most urgently required. Sanction for the erection of a wind-driven pump over the arboretum well has been granted and the disability will disappear when the pump is in working order

1916—17.

For domestic purposes and for irrigating the avenues, arboretum and nursery the requirements of the College when in residence amount to 7200 gallons per day, the actual supplies vary from 2400 to 3600 gallons per day. Hardship, inconvenience and lack of progress consequently result.

Owing to the cost of obtaining water, from a well outside the College Estate through a Contractor, casualties in the avenues cannot be replaced, the welfare of the existing trees cannot be safeguarded, the nursery has until lately been temporarily abandoned and the project of forming an arboretum has been held in abeyance for the past 2 years (it is now being started on a limited scale). If, by an increase in the supply the work of the Engine can be augmented to its full development the planting up of the Estate will rapidly progress and the grounds will present a very different aspect from their present unattractive appearance. The Executive Engineer has been asked to examine five possible expedients for additional sources of supplies (including a windmill, the acquisition of a second well to be worked by the present Engine and the collection of rain water from the roof of the College and all buildings). One or more of these projeets should provide an ample quantity — it is doubtful whether the quality of sub soil supply will ever improve. The cost of planting has been enhanced by the nature of the soil, which necessitates in the case of each tree put in an excavation of many cubic feet to be replaced by red earth brought from a distance. Similarly this soil necessitates the embedding of all buildings, sign-posts, Gymnasium apparatus &c., in a deep concrete foundation.

In wet weather the land is a morass and it has consequently been found necessary lately to connect, by a gravelled path on a stable bed, all buildings frequented daily. The cost of maintenance of roads and paths and of all buildings (excepting such residential quarters as the Public Works Department agrees to maintain) will necessitate a considerable increase to the College budget. It would probably prove a real economy in money and in efficiency to place all the Estate works (road, planting, building) under the control of a whole time officer — a retired Ranger for choice."

1917—18.

In the meantime the College continues to suffer what can only be characterised as a grievous disability from lack of water. The estate is being developed but at a very enhanced cost and progress is necessarily very slow. If an adequate supply of water were assured —and it is only a question of funds and energy—a system of pipes and taps to all parts of the Estate would be laid out, progress would be both cheaper and quicker, the avenues and private gardens would flourish, the College

Museum and all buildings would become covered with the bright blossoms of creepers and the nursery and arboretum would be of real instructional benefit to the students and the 25 acres surrounding the main building would be transformed into something approaching an ornamental park; it is now a dreary Babul waste, in the hot weather fissured with wide and deep cracks and covered with long spear grass and in the rains a morass.

Creepers and ornamental shrubs are being planted round the walls of the main building (as well as of the Museum) but their maintenance under the present conditions is expensive and precarious. During the year about 1200 trees have been planted in the avenues and arboretum and a large number of seedlings have been raised in the nursery.

1918—19.

An area of nearly 2 acres round the main building of the College was converted into an ornamental park in which many varieties of trees &c. were planted. The seedlings were obtained from the Agri-horticultural gardens, Teynampet, Madras. 2400 trees were planted of which 1200 were reserved for the Ornamental Park, 200 for the new avenues and 100 to replace casualties. Creepers and Ornamental shrubs put down in the previous year were maintained at considerable expense. The College is still under the same disability as before as regards an insufficient water supply. The water available in the D. P. W. cistern is about 4800 gallons per day; the deepening of the present Engine well undertaken last year resulted in a very trifling increase to the daily supply. Owing to the laying out of the Ornamental Park nearly double the quantity previously considered sufficient for planting is required and this has to be obtained by hand carts at a very great expense. All residents on the estate suffer grievously from the lack of water. The obvious remedies have been hanging fire for 5 years The full requirements of the College during Head Quarter terms amount to about 14000 gallons per day of pumped water unless the rainfall is plentiful. Students' gardens and servants' gardens were started on the estate during the year."

A perusal of these extracts regarding the insufficiency of water in the College Estate may naturally lead any one to put the question

How do you manage to go on extending your planted area and to open students' gardens and servants' gardens in the Estate?

The answer is:—

(1) For want of scientific methods of lifting water from the nursery well and distribution through pipes for watering the planted area, a batch of 10 coolies is engaged to raise water from the well with heavy galvanised buckets and this water is transported with hand carts to the plants in the park and avenues. This is obviously a very uneconomical method but there is no way to get out of it under the existing circumstances.

(2) The use of water in the students' hostels and servants' quarters is very much economised and the used water from the bath rooms is not allowed to be wasted but is caught in big earthern troughs buried outside the bath rooms. It is this water that happened to be the real source of water supply to the servants' and students' gardens recently started. The students showed so much eagerness and sincerity in their garden projects as to cheerfully undertake the emptying of the refuse water from the earthern troughs with their own hands and created lovely little individual garden plots in the short space of about

7 weeks during the trying heat of September and October, before the break of the North east monsoon. These gardens at the entrance of the College along the Southern Road improve the general appearance of the hostel buildings and make these hostels quite cool and cheerful and they are an object of real attractian to the public. The ladies and gentlemen who pass along the road have their eyes attracted by these gardens during the few minutes of their walk or drive for a distance of about half a mile.

Conclusion.

A list of plants now thriving in the Estate is *attached. The opening of the Ornamental park and the planting up of a great variety of different apecies of trees offer great opportunities for observation and study. It is noteworthy that plants in the open devoid of Acacia arabica trees thrive much better than those which are under complete or partial shade of the babul. The observation made in the Administration report of Bombay for 1917—18 regarding the toxicity of babul on page 52 (Sindh Circle) is also probably applicable to the plants in the College Estate. Further observations on this subject of toxicity will be published in the Magazine from time to time.

K. RAMASWAMI IYER.
5—11—1919.

*List.

I. *Indigenous Speeies.*

Acacia arabica.
A. leucophloea.
Melia indica.
Morinda citrifolia.
Zizyphus jujuba.
Thespesia pupulnea.
Cordia perottettii
Feronia elephantum.
Balsamodendron Berryii.
Balanites Roxburghii.
Capparis divaricata.
Dichrostachys Cinerea.
Tamarindus indica.
Ailanthus excelsa.

II. INTRODUCED:

Very successful.

Acacia auriculæformis.
Peltophorum ferrugineum.
Citharexylum subserratum.
Bassia longifolia. (Planted by
H. E. Lord Willingdon)
Dalbergia Sissoo.
Terminalia Catappa.
Cassia Siamea.
C. emarginata.

Successful.

Kigelia Pinnata.
Lawsonia alba.
Hibiscus
Tecoma stans.
Allamanda.
Cæsalpinia coriaria.
Poinciana regia.
Duranta plumieri.
Thevetia neriifolia.
m/ Jacaranda minosfolia. — failure !
Tabernæmontana Coronaria.
Psidium Guava.
Punica granatum.
Hardwickia binata.
Thespesia pupulnea.
Ficus indica.
Cordia myxa.
Millingtonia hortensis.
Exythrina indica.
Santalum album.
Swietenia Mahogony.
S Macrophylla.
Grevillea robusta.
Holoptelea integrifolia.
Bauhinia tomentosa.
B. variegata.
B. purpurea.
B. racemosa.
Stephegyna parvifolia
Parkia biglandulosa.
P. Roxburghii.
Dodonea viscosa.
Mango.
Sterculia fœtida.
S. alata.
Bignonia megapatamica.
Berrya Ammonilla.
Lagerstrœmia Flos Reginæ.
L. indica.
Gliciridia maculata.
Pterospermum suberifolium.
Myrospermum toluiferum.
Schleichera trijuga.
Strychnos nuxvomica.
Gelonium lanceolatum.
Heterophragma adenophyllum
Sapindus emarginata.
Oredoxa regia
Moringa Pterygosperma.
Chrysophyllum cairito.
Odina wodier.
Melia azederach.
Wrightia tinctoria.
Adansonia digitata.
x Auracaria kooki.

Elæodendron glaucum.
Crescentia alata.
Spathodea campanulata.
Ardisia polycephala.
Mimusops Kakhi.
M. hexandra.
M. elengi.
Filicium decipiens.
Careya arborea.
Polyalthia longifolia.
Dalbergia latifolia.
Dolichandrone crispa.
Calophyllum inophyllum.
Terminalia tomentosa.
Anacardium occidentale.
Albizzia Lebbek.
Nyctanthes arbor tristis.
Plumeria acutifolia.
Anona squamosa.
Ficus elastica.
Acacia ferruginea.
Achras Sapota (Planted by
H. E. Lady Willingdon)
Ficus Benjamina (Planted by
H E Lord Pentland)
Casuarina equisetifolia.
Eugenia jambolana.
Melia composita.
Adenanthera pavonia.
Dracæna sp.
Cassia alata.
Guazuma tomentosa.
Butea frondosa.
Bombax malabaricum.
Protium caudatum.

Failing.

Thuja Orientalis.
Cananga odorata.
Tectona grandis
Castenospermum australe.
Hura Crepitans.
Pterocarpus Santalinus.
P. Marsupium.
Artocarpus integrifolia.
A. incisa.
Phyllanthus emblica.
Averhova bilimbi.
Dillenia indica.
Coffee.
Brownea Coccinea
Ficus religiosa.
Putranjiva Roxburghii.
Calamus rotang.
Jacaranda mimosaefoli
Araucarias
Nyctanthes

Under planting in Nilambur.

I have read with interest articles by several correspondents on the subject of underplanting at Nilambur. So far as I can remember, however, no one has prefaced his remarks by recounting *completely* the conditions to be fulfilled for a proper solution of this problem. Protection of the soil; removal of epicormic branches from the Teak; cheapness of introduction and the possibility of selling the material have, I believe, been mentioned But, after a careful study of the Silviculture of Teak, the ruling condition to be fulfilled is, in my opinion, that *species selected must strictly remain as under-woods throughout the Teak rotation.* There must be no competition for growing-space between them and the Teak.

Silviculturally and financially the Teak must be given "proper" growing-space — temporarily and at suitable intervals freed on all sides –, for the development of the greatest volume and highest quality. Nevertheless, whatever the growing-space given, the Teak is deciduous during the hottest months of the year and the primary object of an under-wood must be to give shelter to the soil during these months. That it should keep the boles of Teak clean of branches; be cheap to introduce and be saleable are entirely secondary considerations.

That numerous epicormic branches are to be seen on the majority of trees at Nilambur is a phenomenon, which, at first sight, might lead or rather mislead one into attaching undue attention to the need of an under-wood for their prevention, or at least removal. To remove them, an under-wood must be grown sufficiently dense to effect this by friction. Indeed, observation shows that reduction in intensity of light has little effect. Light, in fact, is not even the primary cause of their origin. The chief causes are (1) restricted crowns, due to provision of insufficient growing-space in the past, and (2) defoliation by caterpillars which is immediately followed by the development of many dormant buds not due so much to increased light as to the attempt of the tree to obtain, in the interval before it can develop new crown leaves, sufficient leaf surface to maintain that concentration of the cellsap necessary for the vital functions of absorption and transpiration of water and therefore growth. The first of the above primary causes can be removed by provision of proper growing-space — thinnings aiming at "normal" crown development The second must remain so long as the defoliaters continue to be a pest. At the same time observation shews, other conditions being the same, that the better the crown development of a tree the fewer the epicormic branches that persist after defoliation. In fact the means necessary to remove the first cause will also greatly reduce the evil effects of the second. Finally, the presence of epicormic branches with the resultant knots in the timber has little effect on the price, except in the case of badly affected logs, the majority of which are obtained from seriously dominated or supressed trees — types which should rarely be found in pure Teak woods if properly thinned.

To sum up, the essential conditions to be fulfilled are :—

(1) The under-wood in Teak woods must not be allowed to grow to a height of more than 70 feet on the best and 40 feet on the worst soil.

and (2) The species forming the underwood must be evergreen, or if deciduous, leafless only for a short period, such as Dalbergia, Xylia etc: Several species can be named which would fulfill the second and it is therefore, the first which is the ruling condition. Subsequently, having fulfilled the above, it must be advantageous if (3), the species will grow up sufficiently densely to prevent by friction the persistence of epicormic branches resulting from defoliation, and (4), by the end of the Teak rotation of 70 — possibly shortly 60 years, give a money yield, whether derived from timber — as defined in the Forest Code, firewood or other produce, which will at least pay off the capital outlay on their introduction together with Compound Interest accumulated to that date.

In conclusion I should like to see further contributions from your readers which would attempt to indicate one or more species that will fulfill at least the essential conditions referred to above.

R. Bourne.

[We commend this interesting and suggestive letter to the careful examination of all practical Foresters who have had an opportunity of examining the problem.

By reason of his exceptional experience and study of the Nilambur Teak Mr. Bourne's views are entitled to the highest consideration. Editor.]

Sandalwood Observation Areas.

NAMAKKAL RANGE.

This article relates to the observations made in 1918—19. Observation area No. I referred to in my last article (The Madras Forest College magazine Volume IV. No. 1 Page 32 et seq.) was ordered to be abandoned. All the spiked trees in this area were extracted in March 1919. On 22nd July 19 we noticed spike reappearing here;

2 spiked trees close to the boundary line of the Observation area were noticed.

2. In observation area No. II, there were 9 spiked trees and a dead tree on 6–12–18. There were 11 spiked trees on 23—7—1919. Of the additions, one was in February 19 and the other in March 19. The phenomenon of dead twigs in branches of trees not attacked by spike is very characteristic of this area.

3. *Spike cannot be arrested in an affected tree by pruning off the spiked branches.* On 22—3—19 in the case of trees Nos. 33 and 73, 4 spiked branches and 1 spiked branch respectively were pruned off by me. On 25—4—1919 other branches were noticed to be spiked in both the cases. On 28—7—1919 we noticed that *all* the branches of tree No. 33 were spiked. Tree No. 33 was spiked in *one* of its branches on 3—12—18, in 3 of its branches on 22—2—13 and in 4 branches on 22—3—19. All the 4 branches were pruned off on 22—3—19. On 25—7—19 the *whole* tree was found to be spiked. The history of tree No. 73 is as follows :—It was healthy on 3—12—18 and on 22—2—19; one spiked branch - the lowest branch of the tree — was noticed on 22—3—19 which was pruned off. On 25—4—19 the leading shoot was found to be affected. Again, in the case of another tree (No. 34) only one branch was spiked on 3—12—18, when it was pruned off. On 22—2—19, I made the observation that only top branches of this tree were affected. On 22—3—19 the leading shoot and 1 branch were noticed to be spiked. On 25—7—19 it was found that only one branch had normal leaves, all the rest being thoroughly spiked. I believe that observations on these 3 trees are conclusive enough to establish that spike cannot even be temporarily arrested by pruning off the spiked branches.

4. Another observation made here is that "*brittle leaves*" *is no sign of prospective spike in a tree.* On 3—12—18, the District Forest Officer noted down tree No. 151 and certain others as containing "brittle leaves" in large numbers. On 25—7—1919 it was found that ***not one*** of these half a dozen trees had got spiked.

5. *Uprootal of spiked trees has no effect on the surviving healthy trees.* In observation area No. I, all the spiked trees (74 in number) were uprooted in March 1919. In July 19, we noticed that 2 trees had just got spiked in this area. This fact is corroborated by what is happening in other parts of the range where spike prevailed and has again appeared after uprootal of the spiked trees.

6. In my previous article I made the observation that spiked trees took from 12 months and 2 days to 12 months and 23 days to die. The data given below would show that trees of 1 foot and below in girth (trees Nos. 32, 36, 83 and 156) have taken about 8 months to die. Trees of over 1 foot girth (Trees Nos. 23 and 33) take a longer time to die. Data with regard to death of spiked trees in Observation area No. II is given in the Statement below :—

No. on the tree.	Girth of the tree.	Spiked on	Health condition on 25—7—19.
23	1′ 3″	29-8-1918	Branches dead; tree almost dead; the tree had a few spiked leaves on 25—4—19.
32	4″	3-12-18	Dead; no leaves; had a few spiked leaves on 25—4—19.
33	1′ 2″	do	All branches spiked; tree is not yet dead.
34	1′	do	Only one branch with normal leaves; rest of the tree completely spiked.
36	8″	3-12-18	Dead; was leafless ever since 22-2-1919.
44	2″	do	Doubtflul spike; there were 12 normal leaves; the other leaves were suspicious.
66	8″	22-2-19	Fully spiked.
73	2″	22-3-19.	The leading shoot alone is spiked; branches bear normal leaves.
83	7″	3-12-1918	Dead; leafless on 25—7—19; it had few leaves on 25—4—19.
156	1′	29-8-18	Dead on 25—4—19; on 22—3—19 it was noted as dying.
160	9″	3-12-1918	Fully spiked; branches dead; a few normal leaves at tips of branches.

7. In the case of tree No. 44 it was first observed to be spiked on **3—12—18**; the health condition of the tree was then noted down as "half the tree spiked"; on 22—2—19 the observation was "spiked: three fourths of the tree affected"; on 22—3—19 the observation was "Fully spiked; very few normal leaves"; on 25-4-19 it was "few spiked leaves;" on 25-7-19 we noticed that while there were a dozen doubtless normal leaves on the sapling, the remaining leaves though dwindled in size were not spiked leaves. They looked like new flush of leaves but were not tender; nor were they confirmed spike leaves. We doubted whether this might, after all, be a case of recovery from spike. On 24—8—19, the doubts vanished as distinctly spiked leaves were noticed by me on the sapling.

S. G. VENKATARAMA AYYAR,
Forest Range Offiicer, Namakkal.

Extracts from "Forests and Gardens of South India" by Dr. Cleghorn published in 1861.

[The College Library contains a copy of this interesting work which throws much light on the conditions of Forest Work 60 to 70 years ago. The book contains several excellent engravings. Dr. Cleghorn was the first Conservator of Forests in Madras.]

* * *

The earliest reports published are those of Dr. Wallich, the first of which was dated so far back as 1827, and refers to the Salween Forest, north of Moulmein. The result of his labours may be said to have laid the foundation of a system of conservancy, without which it would soon have become impossible to maintain even the existence of of our most valuable Eastern forests.

* * *

When Dr. Brandis was appointed by Lord Dalhousie to the charge of the forests of Pegu, it was intended to pursue a policy of strict conservancy, such as was proposed by Wallich upwards of thirty years before; but, as it was then impossible to adhere to it, it has again been found necessary to relax the stringency of rules which were too severe to be practicable.

In 1805, the Bombay Government, for the first time, laid claim to the indigenous forests of the western coast, and appointed commissioners to fix their boundaries, the Company's right of sovereignty being asserted by a proclamation issued in 1807. From this period up to 1822 a partial and somewhat ill-advised attempt at conservancy was made, but it thoroughly failed in its object; and all the restrictions which has been imposed during its existence were removed.

* * *

The Forest Department was not organised until 1846, under the superintendence of Dr. Gibson, who ten years afterwards published a short treatise, in which he gave a historical sketch of the department from its commencement. The handbook and Dr. Falconer's "Report on the Teak Forests of the Tenasserim Provinces" are works of the highest importance, especially to those interested in the preservation of teak forests.

* * *

A code of forest regulations for all India is much wanted. If this was drawn up and sanctioned, the rights of Government (which are in some districts in a confused state) would be placed on as equitable and sound a basis as the rights of the people themselves.

The present volume was prepared at the instance of Government, principally for the purpose of furnishing a continuous view of forest conservancy in the Madras Presidency during the four years that the department has been in operation.

* * *

In the beginning of this century, an immense almost unbroken forest covered the Western Ghats, from near the watershed to the most elevated ridges, — left to nature, thinly peopled, abounding in wild animals, and all the higher portions, without exception, covered with timber. Now the passing traveller, looking down from the higher peaks of Coorg or Malabar, conceives that an inexhaustible forest lies below him; but as he descends the ghats, he finds that the best timber has been cut away, and that the wood-contractor is felling in more remote localities. I refer especially to teak, blackwood, and poon spars, which are every year becoming more scarce in accessible situations.

* * *

In regard to forest arrangements, I may observe that Canara, though still imperfectly organised, is in advance of every other district.

* * *

In the Official Road Book, published by Major Scott not many years ago, opposite Waliar, we find this remark, "Dense Jungle, beware of elephants;" but in looking from the staging bungalow, the traveller sees several tentative lines of rail, each 200 yards broad, and so extensive a clearing of the neighbouring forest, that no elephant could easily find a cover. The encircling hills, formerly crowned with timber, are now to a considerable degree laid bare. These changes, so far as I can learn, have been the gradual result of unrestricted cutting, but much aggravated, during the last few years, in connection with the enormous demand for railway sleepers, and for the department of Public Works. In the contracts which have been made for the supply of the Bombay railway, 1½ rupee has been charged per tree. In some contracts for the supply of the Madras railway, 3 or 4 annas has been the seignorage per sleeper, according to the kind of wood and the facility of transport; and, with the permission of government, I would recommend that at least three annas be invariably paid.

* * *

The importance of saving every foot of teak (at a time when Government has been put to great shifts for its own requirements) has been strongly impressed upon every member of the department.

* * *

Along the whole length of the Malabar coast from Goa to Cochin, *there is now very little of this wood in a ripe state* on Government land below the ghats, and there are only three localities above the ghats where I found teak in abundance and of good size, viz.,—

(1) The Anamalai Forest in Coimbatore.

(2) Wainad and Haggadevankota (partly in dispute between Mysore and Malabar.)

(3) Gund Plateau, North Canara, near Dandelli.

* * *

The *prospective supply of teak* (roughly estimated at the rate of the present requirements) from the forest now rented from the Colongad Numbady *will not apparently exceed 15 years.* This is a serious consideration, as it is the only forest from which long planks suitable for a frigate can be procured. I have in view a scheme for consolidating the table land of the Anamalais, that part belonging to Government as well as that rented from the Colongad Numbady, into one Government forest, which should be a reserve in perpetuity for the Indian navy, and where planting operations should be systematically carried on.

* * *

The *average price of teak* at the quarterly auctions held at Mysore has been almost exactly the same as at Anamalai, about *one rupee per cubic foot.* I have experienced great difficulty in obtaining exact information as to the extent, tenure, revenue, and productions of this forest, on occount of its being little frequented, from the fear of wild animals. In no place have I seen such abundant traces of elephants.

* * *

Conolly Plantation:— The fine and promissing plantations on the banks of the Nellambur River, which were commenced about fifteen years ago by the late lamented Mr. Conolly, Collector of Malabar, are worthy of a full and separate report, which will be a historical record of what can be effected by artificial means These plantations will be an important source of supply in future years. They are under the immediate charge of **Chatu** Menon, a Nair, who conducted all the preliminary experiments under Mr. Conolly's orders, and who has watched the young trees from the day of germination. I propose that two

Duffadars should be sent, one to the Anamalais, and one to North Canara, to introduce the Conolly system of plantation into those districts.

* * *

Since writing this, I find that the Nair subordinates are unwilling to leave their native place. One has been found ready to proceed to the Anamalais, but no one is willing to proceed to North Canara on any terms; therefore one of the Canara establishment will be detached for instruction to Nellambur.

* * *

From information received from the late Assistant-Surgeon Drew, I was enabled to communicate to the commissioner of Mysore the existence of a large band of smugglers in an unfrequented path near the Carkur Pass, who were captured by the Mysore horse, to the number of seventy-eight, with the sandalwood tied on their backs. This seizure effectually stopped a long-continued system of robbery on the Malabar frontier.

* * *

I here beg to annex extract of letter to the Collector of Coimbatore, dated 2nd October 1851, which contains my views in reply to a reference upon this important matter :– "The higher sholas, cooling the ghats on both sides, are of the utmost importance, and the climate is believed to suffer the greatest detriment from their removal. I would therefore suggest that the high wooded mountain tops overhanging the low country (such as Hoolicul) should be preserved with rigid care; the forest there should not be given over to the axe, lest the supplies of water may be injured. It is the opinion of many persons, in which I concur, that the vast clearings which have taken place have had a share in producing the irregularity of the monsoon, which has of late years been so much complained of in Coimbatore. In order that the couse of the rivulets should be overshadowed with trees, I conceive that the hills should be left clothed to the extent of about half of their height from the top, leaving half of the slope and all the valley below for cultivation. This available portion would far exceed in extent the higher ridges, which should be conserved."

* * *

Difficulty of procuring Assistants.—The removal of Captain Michael to Hydrabad, followed by the withdrawal of Captain D. Hamilton and the death of Assistant-Surgeon Drew, put me in a difficulty for some time. The two first were most zealous and willing assistants, and the last, from his patient habits of inquiry and botanical knowledge, gave promise of peculiar usefulness. The vacancy at Anamalai has been filled by Lieutenant-Beddome, an excellent explorer, who has a good knowledge of the vegetable kingdom, and was recommended to Government solely on account of his powers of observation and description.

* * *

Sub-Conservators in Canara.—The two subordinates I found in North Canara, under Mr. Muller appeared to be much too sedentary in their habits, deputing peons into the jungles when they should have gone themselves, and the like. The former has been removed from the department on account of incapacity; the latter is suspended under an inquiry for receiving bribes.

Enropean Contractors.—Two contracts have been entered into with Mr. Ross, resident railway engineer, Coimbatore, whereby he has been permitted, first, to cut sleepers of certain specified woods in the forest near the foot of Anamalai, paying seignorage at the rate of 3 annas per sleeper; and, second, to fell 2000 trees in the Waliar jungle, at the rate of 1 rupee 8 annas per tree.

* * *

In several instances I have urged the location of two taluk peons, as at the top of Palamanair Ghat, and at Devaroydrug in Mysore. The vigilance of two men during twelve months, at a cost of 7 rupees per month, has produced visible results; although the conservancy has not been adequately provided for, yet the jungle already begins to assume a much improved appearance.

* * *

In addition to the absolute scarcity of suitable men, the exposure personal risk, and low salary compared with that sanctioned in the Public Works, have united to deter men from entering the department; whilst the formation of the Police and Revenue Survey Establishments have attracted others whose services might have been available. Out of the large body of Europeans who have this year been sent out to India, I hope to find one or two who have a practical knowledge of wood-craft.

* * *

I have the honour to enclose a specimen of the "Manual of Indian Botany," now being prepared in compliance with the wishes of the Honourable Court of Directors. The small amount of time which I can spare from other avocations, the bodily fatigue and exposure I undergo, and the absence from my library for great part of the year, will necessarily protract the preparation of the work; but the great opportunities I enjoy of collecting materials are eagerly laid hold of, and I trust that the Manual may, when completed, be a useful guide to the botanical riches of the Presidency.

* * *

Colonel Gilbert's plantations, commenced in 1804, are generally failures, owing to the injudicious selections of site too near the sea. The Conolly Plantations, on the other hand, are in a very promising condition; and the Government recognise the very great importance of restoring the ancient and valuable forests of Malabar, and will be glad to receive the report preparing by Dr. Cleghorn.

* * *

The Conservator here represents the difficulty of procuring suitable Overseers; and he shows the causes which combine to prevent qualified persons from entering the department. If, on further experience, these causes are still found to operate detrimentally to the interest of the establishment, it will be Dr. Cleghorn's duty to propose a remedy in the shape of a higher scale of remuneration.

* * *

Specimens are to be seen in different parts of the plantations of trees from one to fourteen years old, all growing most luxuriantly, and with a regularity and straightness which leads me to suppose they will become very valuable timber. The older trees had not, in my opinion, been thinned sufficiently; but I have no doubt this error will be remedied under the able management of Dr. Cleghorn.

* * *

"I look upon this as a most important matter, and one worthy of being brought to the notice of the Supreme Government, as too great pains cannot be taken for increasing the future supply of timber. The native sub-conservator, Chatu Menon, is stated by Dr. Cleghorn to deserve the highest credit for his care of the plantations for fourteen years. He is desirous of receiving some token of the approbation of Government; and I would propose that an ornamental woodman's knife should be given him."

* * *

Two supplies of sandal-seed were sent to Major Phayre, commissioner of Pegu, for the king of Ava.

* * *

In anticipation of Lord Harris's visit to the forests, a wooden bungalow was erected, at a cost of about seventy rupees. This amount is included in the hunting expenses. The building has proved very useful for the establishment.

* * *

My writers and duffadar have several times been changed, the fever frightening them away; and one writer, who had been two years in the Forest Department, died from jungle fever.

The Madras Railway has hitherto used to a very great extent the indigenous woods for sleepers. About thirty kinds of timber have been tried experimentally, but the experiment has not been attended with satisfactory results—not always because the wood were worthless, but from the timber not having reached a sufficient age, and from its being used in a comparatively green state.

* * *

Teak, which is more durable that any description of fir, although prepared with creosote, and the best of all woods for sleepers, is considered by the officials of the Company too expensive.

* * *

Teak scantling of large size is becoming more and more scarce all along the west coast. The fact is, in Malabar, first-class logs are not easily procurable.

* * *

The most important are the "Conolly Plantation". These young forests have been hitherto a source of expense ; but last year the returns for the first time exceeded the expense of their maintenance:—

Expenditure, 1859—60	Rs. 3493—0—6
Income, ...	Rs. 5165—2—9
	Rs. 1672—2—3

Situated as these plantations are on the banks of the Nellambür River, the value of the timber is enhanced by the fact that it is so easily transported, while the Malabar forests are so much exhausted.

* * *

At the close of this Report, it may not be out of place to draw attention to the fact, that since this department was instituted, three years ago, many changes have occured, and the field of operation has gone beyond the original scheme. In this way difficulties have sprung up which could not have been anticipated, and defects, therefore, can be pointed out which, while matter of regret, are only the natural consequences of circumstances beyond our control. The establishment is now too limited to embrace all the duties which at present devolve upon it. The extent of country to be conserved is out of proportion to the means placed at the disposal of the department for its protection. Originally, it was not contemplated that we should organise a police establishment, as it was understood that the forests would be under the same protection as other public property. The number of sanctioned peons — fifty three permanent for the whole presidency — is quite inadequate, and the forests, consequently, are only partially protected.

* * *

One great want of the department is, an additional assistant, who, while learning his duty, could afford useful aid, and afterwards be competent to fill any unexpected vacancy (such as those which have occured this year). Two hundred rupees staff salary would be sufficient. The advantage of a trained assistant on emergency is self-evident.

* * *

Exploring Tours.— During the past three years, annual tours of about nine months' duration have been made, during which a very large portion of the presidency has been traversed, and all the more important forests have been to some extent explored. Considerable additions have been made to our knowledge of the interesting and important region of the Anamalais and confines of Travancore, by a second exploring tour of lieut. Beddome, the report of which has already been published. The sal forests of Gumsur wore visited by me in the early part of last year, and an extract from my diary is contained in App. G. When Mr. Beddome has visited the Nalla-malai range in Karnul, there will remain no extensive tracts of importance wholly unexplored. The further examination of these will be undertaken as circumstances permit.

* * *

In may 1859, a sanction of Rs. 50 per month was granted by Government for the conservation and working of Sigur Forest. (G. O. No. 668).

* * *

Besides the supply of sleepers, there is a considerable amount of timber cut for building purposes, and an increasing demand for export. I have granted 300 licenses for permission to cut 6470 cart loads of timber in the forests of Salem, for the year 1859—60. A seignorage fee of Re. 1 is paid for each cart load of wood; this amounted is collected at the different police stations under the management of the collector, and has been entered in the books as land revenue, without a separate column. I have no hesitation in stating that a much larger amount might be realized, if the holders of the licenses were made to abide by the terms laid down in the license.

* * *

Overseer Yarde reports having marked 2803 sandal-wood trees on the Javadi Hills, varying from 3 to 14 feet in length and 10 to 30 inches in girth. About 15,000 young plants have been counted and ann registered; I am now proceeding to these hills for the purpose of ascertaining whether any of the sandal-wood trees are full grown, and fit to be cut into billets.

* * *

On 31st January 1859 I took advantage of the departure of Her Majesty's steamer, Dalhousie, to visit the Norther Circars. On the following day, the vessel touched at Eskapilly in Nellore, to take in treasure. The shore is barren of wood; palmyrahs are seen among the sand hills; but, except the extensive salt pans, there is nothing of any interest.

* * *

My attention was directed to a Mangrove belt on the edge of backwater, which was formerly barren waste. In the year 1839, two cart loads of seeds of species of Rhizophora (Uppa ponna), Avicennia tomentosa (Mada chettu), and Sonneratia acida, had been procured by Mr. Rohde (at that time Judge), at a cost of 25 rupees; the seeds were dropped into the mud of the estuary by convicts. The belt sprung up quickly, and has been annually cut, yielding a trivial revenue as firewood and for feeding cattle. It is also useful in preventing the channel from being clogged with drift-sand. In the canal basin, I saw a dozen firewood boats which had come in during the night from the Godavari, and concealed below the heaped up billets I recognised house beams of Yepi (Hardwickia binata), and Siriman (Conocarpus latifolia).

Vizagapatam, 6th.— This is a picturesque station, but the red soil does not seem suited for tree culture; and the only places where I found fine trees were the gardens of Goda Surya Prakasa Rao and Narayan Rao; there were mangoes, sapodillas, oranges, and Lagerstrœmia Reginæ. The cashew thrives well at Waltair.

* * *

It may be well to mention, that there is a good road from Ganjam to Russelconda, (via Berhampur), in which the streams are all bridged, and carts have recourse to the forest from Russelconda, and even Ichapur, a distance of 76 miles. It was a most interesting sight to see 80 children of the state (Sirkar ki Bucha), as they call themselves,—rescued Merias, engaged in making a road, calculated to develop the resources of the country, and to civilise the Kunds. The wage of these Merias was Rs. 4, and boys Rs. 3 per mensem. I put the following questions to the headman of a Meria village, who was the first man rescued from death.

* * *

The casuarina thrives well, and furnishes a useful wood, which, however, does not answer for fuel, as it does not split easily, and yields little wood when pollarded. Besides, it would be better to plant quick-growing woods.

* * *

All that is wanted is conservancy, so as to prevent tracts being quite cleared, to hinder persons from injuring the roots, and to arrange for the renewal of trees cut down. One part of this scheme would be to leave a certain number of standard trees per acre, say thirty or forty for shade and for seed, instead of shaving off everything to the root, by which means both the medicinal products as well as the larger fuel will gradually but certainly disappear.

* * *

At the close of the present lease it will be well to consider whether it be advisable to continue the system of renting out an eighth portion of the forest *to be cut down to the ground.* If the trees were headed down to 6 or 8 feet and allowed to produce lateral shoots, these would become very numerous and produce a greater supply of branches to be sold in bundles for firewood.

*   *   *

And the question is frequently asked by private individuals, "what is the best kind of tree to grow for firewood" There can be no doubt that, in the neighbourhood of large towns, along the lines of railway, in the vicinity of iron foundries, sugar factories, engineers, workshops, &c., this necessary of life is more scarce and expensive than formerly, owing to the greater distance from which it is brought and the unrestricted license with which it is cut.

The marvellous changes which are taking place will probably render new regulations necessary for the continuance of the supply. The consumption of fuel is very great near some of the works alluded to. It is not far from the truth, that four sugar factories (Astagram, Aska, Chittavalsa, and Rajamundri) burn from 10 to 20,000 tons each in the working season: and the railway demand for sleepers requires 20,000 tons for every fifty miles under construction, besides other factories and great works hastening the clearance of the jungles.

*   *   *

In Utakamand, the ripe trees of the indigenous sholas are sold by auction, fetching a small return (Rs. 20 or 30 per shola). As the influx of settlers increases, the original tree vegetation will disappear entirely, prohibitory rules will be futile, and then proprietors will plant according to their own requirements, and a few probably for profit. The experimental plantations of Government show that this may be done successfully.

*   *   *

I may mention that, in particular districts, the names of certain civilians are long remembered in connection with the planting of topes and trees. For instance:—Mr. Orr, Salem; Messrs Sullivan and Thomas, Coimbatore; Mr. Robertson, Bellary; and Mr. Rohde, Guntur.

* * *

There can be no doubt that the forests in the vicinity of the hill stations have greatly suffered of late years; but private planting, at least at Utakamund, is largely on the increase. I have no doubt that, in the course of the next ten years, the wants of the community, so far as fuel is concerned, will be in great measure supplied from private plantations The great object in the meantime is to prevent the Government woods being destroyed.

The conservation of these is necessary to preserve the water springs, for shelter, &c; and I may here add, that so long as persons can cut *ad libitum* in Government forests without payment, the most powerful incentive to private planting is lost.

It is difficult to say exactly what the requirements of the Utakamund community may be. There are at present 7420 houses (European, 273; native, 7147*), and I suppose about 4000 fires are daily burning during great part of the year. For six or seven years past the main supply has been brought from the west-ward; and on the side of the road to pykara, about twenty sholas (large and small) have been very much thinned out.

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* ("The population cosists of -- Europeans, 2500; natives, 34,500 East Indians, 500. Every European house has three or four fires daily,"—E. B. Thomas, Collector.)

* * *

With the funds thus procured, I expect to be able to entertain one, if not two additional European foresters. The expense thus incurred will be Rs 35 for one forester, with six peons each, Rs 35; + 65 = 100. Without additional aid of this kind it is hopeless to attempt efficient conservancy.

* * *

I have visited Mudumalai Forest to enable me to report on the system of management, in accordance with the order of Government, 4th July 1859, No. 1637. The size of the logs there is greater than at Sigur, averaging 16 or 18 feet; and I think if Col. Lawford had the same opportunities of judging as I have had when traversing the forests he would not have condemned the timber. The quality generally appears to be excellent; the quantity in seasoned logs is not far from 25,000 feet; of this I saw 18,000 feet, which had been dragged to the side of the forest road.

* * *

Apart altogether from the possibility of the seat of Government being transferred to the Nilgiri Hills, other important movements are either progressing or contemplated; and, indeed, it has recently been found necessary to appoint a special assistant to take charge of this important range.

* * *

The greater part of the wood brought into Utakamand is fetched by Badagas, and is cut within 2 to 7 miles of the limits of the cantonment. The right to move dead trees necessarily induces an interest in destroying them. The present establishment, consisting of a forester and 6 peons, for the conservancy of the Nilgiri Sholas, seems susceptible of improvement. One or more foresters are required; but the peons, unless instructed and carefully selected men, are comparatively useless.

* * *

Let us take, for example, *Wellington. That station may be said to be entirely destitute of trees* Having had frequent opportunities of observation during the last three years, I am strongly impressed with the opinion that the larger proportion of disease at Wellington than at the neighbouring station at Kunur, is due, in a great measure, to this circumstance, viz, the want of wood; as, in all other respects, height, temperature, exposure, &c, there is scarcely any appreciable difference between the two places. I think, therefore, that, by planting trees judiciously, great benefit would be derived, not only from the shelter they would afford, but from the good effects produced by a moderate quantity of vegetation in purifying the atmosphere.

* * *

The Government readily sanction the small sum of Rs. 1350, requested by Dr. Cleghorn for the ornamental planting of 10,000 trees in the neighbourhood of Utakamand, under the superintendence of Mr. M'Ivor, under the conviction that the outlay is trifling in comparison with the advantages to be derived from the proposed plantation, even in an economical point of view, and that it is highly desirable that an example of successful planting should be placed before the residents on the hills in each of the chief places of resort, as an encouragement to others to engage in an enterprise which, while it will be generally beneficial, will also be individually remunerative.

* * *

In 1856, Mr. Tuke was sent to explore the Savitri river, He penetrated into a forest about 130 miles distant from its mouth He mentions, that he had no doubt that there were 800 good (teak) trees in the neighbourhood of Kannirirada He specifies, that he met with trees measuring 11 and even 15 feet in circumference, and from 30 to 45 feet in length, proving that the teak grows to its full size in that country.

* * *

Avenue trees are of immense consequence to the trunk roads of the country, and in some districts, they are nearly as essential to the convenience of travellers as a smooth surface. It has been proved, I think, that carts travel further in a shady road than in an exposed tract.

* * *

Dalbergia latifolia.— Planks 4 feet broad are often procurable, after all the external white wood has been removed.

* * *

The present price of teak wood of long scantling is Rs. 3 per cubic foot, double the ordinary rate.

* * *

It is stated on the authority of Major Lawford, that the true Sissu, *Dalbergia sissoo,* is found in great abundance in Wainad.

* * *

The appointment of Conservator of Forests was made in December 1856.

* * *

Bassia longifolia.—Good wood for trenails; it is comparatively free from the attacks of the *Teredo navalis;* it is procurable among the logs brought down the Godavari. It is valued for all purposes, in situations where it is not exposed to air, as planking of ships below the water line, frames on which well walls are built, &c., Nearly equal to teak, but smaller. Much used for constructions of carts at Coimbatore; and in Malabar, where it attains a large size, it is used for spars.

* * *

And the opening up of two new roads which have been for some time under the consideration of Government — I refer to the Karkur Ghat in Malabar, and the proposed road from the Anamalai Hills to the Cochin backwater — would facilitate the delivery of the wood. These great lines (the latter especially), would open up dense forests, and throw much * angili timber into the market.

* * *

Mr. J. S. A. Kohlhoff, Conservator of Cochin Forests, writes:- "I have the honour to acknowledge the receipt of your letter, enclosing a letter from Dr. Cleghorn, calling for information regarding the probable, quantity of * angili wood obtainable annually in the Cochin Forests, and beg to state in reply, that, owing to the high rate that angili wood sells at in the market, and it being considered more durable than teak for building boats, &c., such great quantities of it have been annually taken away by timber merchants, that the greater portion of these forests are almost exhausted of timber of this description. There is, however, a tract of magnificient virgin forest, at an elevation of nearly 3000 feet, about 40 miles S. E. of Trichur, extending to the S. and W. of the chain of hills marked Nocoon bund on the Survey Map, No. 62, which have never been penetrated by timber merchants, where I have observed the angili growing in abundance, many trees of the largest dimensions, and have been informed by the kaders (or hill men), that the tree is very numerous in all the sholas (or dense jungles) on those hills. I have reason to believe, therefore, that this tract of forest is fully capable of yielding at least 2000 candies of angili timber annually, of superior quality and dimensions; as also a good supply of poon spars for ships' masts."

* * *

Mr. C. F. Kohlhoff, Conservator of Forests, Travancore, writes :—" I have the honour to acknowledge the receipt of your letter, and in reply beg to state, that the angili wood trade in Travancore is an open trade, where in the sirkar have no dealings whatsoever."

* * *

Anaimalais :—The upper ranges are in undisturbed possession of wild beasts; we saw a large herd of bison, with deer and ibex in numbers, and also traces of wild elephants.

* * *

In January 1845, the Government of India, on the recommendation of the Government of Madras, authorised an increase to the teak plantation establishment of the collector of Malabar, which raised its aggregate cost from Rs. 221 to Rs. 314—8—0 per month, including Rs. 50, the salary of the native sub-conservator. This increased establishment was represented as necessary in consequence of the extended scale on which planting and sowing were being carried on by Mr. Conolly, whose report calls for some notice

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* [Artocarpus hirsuta. ED.]

* * *

There was, however, yet another difficulty to be overcome before the plans pursued by Mr. Conolly could be perfected; this was the pruning and tending the young plantations. On this point Mr Conolly was endeavouring to afford all the assistance he could to the sub-conservator, who was a native of the district, by instructing him from books which had been sent out for the purpose by the Court of Directors instead of the arboriculturist, for whose services so many applications had been made.

* * *

I can assure the Honourable Court, that their expression of confidence in Mr. Conolly's exertions for establishing a good system of management in the teak forests, as far as the plantations are now advanced, is well merited. I have had much experience in plantations and woods on my own account at home, as well as in those of other proprietors, but I never saw a better commencement than in the Government teak plantations of Malabar.

* * *

I may remark, from all I have heard and observed, that teak requires the same soil as oak, viz., a strong pure clay.

* * *

Extract Letter from H. Cleghorn, Esq., M. D., to the Secretary to Government.

Sir, 27TH SEPTEMBER 1860.

"I have the honour to acknowledge the receipt of the order of Government, dated 25th instant, calling for information regarding the supply of teak-timber of large dimensions from the W. Coast for Admiralty Purposes. The old forests of Malabar do not now contain much timber of frigate Scantling.

* * *

Looking at the increasing scarcity, and the greatly augmenting demands for timber, I think Government should begin at once to plant freely. The Conolly plantations are now beginning to pay and promise well. I would urge the doubling of the grant for this. We now plant nearly 70,000 trees annually for about Rs. 3000, which include the care of those already planted; with Rs. 6000, or only £ 50 per mensem, we could almost double the rate of progress, and I am confident it would prove a good investment. I have explained my views to Lieut. Beddome, who will arrange satisfactorily for this extension of operations, if Government sanction it."

[LETTER ENDS.]

* * *

Planting operations on a large scale have been commenced on the Madras side since 1843, with the same laudable design that led the Government of Bengal to attempt the same thing here in 1800 and 1812. The young trees have been planted to the number of 450,000 at 8 feet apart. It is to be hoped, that the failure on this side will be before them, as a beacon to warn them from committing the errors which were fallen into here, and which proved so ruinous in the end.

"H. FALCONER, M. D."

All cases of violation of the forest rules may be tried and decided by the Superintendent of Forests, either by personal inquiry into the facts, or on the record of inquiry made by a forest assistant. In any case the decision, and the grounds for it, shall be recorded, and the same will be open to appeal to the Commissioner.

Whenever a person is sentenced to fine, and in default to imprisonment, by the Superintendent of Forests, the person so sentenced shall be forwarded without delay to the officer in charge of the district within which the offence was committed, together with a copy of the sentence, and the said officer shall forthwith proceed to execute it.

By order of the Commissioner,
D. BRANDIS,
Supt. of Forests in Pegu.

* * *

Some years since (1839), one Agri-Horticultural Society was established in Bangalore, under the auspices of the Commissioner, who made the Lal Bagh over to them, and afforded other assistance in the way of convict labour, &c. In all other respects, the Society was supporters, by private contributions; but the constantly fluctuating number of subscribers, the frequent departure of valued supporters, and other similar causes, led to the dissolution of the Society in 1842; and the garden was then restored to the Commissioner.

* * *

As above stated, the Mysore Agri-Horticultural Society was dissolved in 1842, owing to the constantly fluctuating state of society in the station.

* * *

Forest Rules in Sind.

The establishment of the forest department consists of 1 Forest ranger, 2 deputies, 1 Inspector, 1 accountant, 1 head munshi, 1 second munshi, 2 writers, 12 forest karkuns, 2 daroghas, 13 jamadars, 98 peons. The forest ranger has the general management and control over the whole department; he personally inspects the forests during six months of the year.

* * *

The total cost of the establishment is Rs. 2199 per month. The total extent of forest under supervision it 700 square miles on the lowest computation, and thus the cost of supervision is on an average Rs. 3 per square mile per mensem.

It is calculated that this year, 1859-60, for every rupee expended in establishment Government will receive back Rs. 2—9—7.

* * *

Utakamund Garden.

6TH AUGUST 1857.

The earlier stages of the garden's existence have passed; and I need not perhaps allude to the great difficulties to be overcome in commencing a garden on these mountains with a scanty income of Rs. 100 per mensem, and the experience to be gained before exotics from various lands could be successfully introduced.

* * *

On the other hand, the Acacia robusta of Australia is in such abundance as to stamp a peculiar feature to the scenery, which is entirely wanting in the drawings of Utakamand (Colonel M'Kurdy's) printed fifteen years ago.

* * *

Apprentice D. Hopkins, aged seventeen years, has been three years in the gardens; for the first two years he received Rs. 10, and this year Rs. 15 per mensem. He writes the garden accounts, and has been trained to practise grafting, budding, &c. It is proposed that he receive Rs. 20 a month during the fourth and last year of his apprenticeship. Another lad, aged thirteen, has been instructed for six months, but he was found to be deficient in preliminary training.

The system of instituting a class of apprentices is a good one, of special importance to young lads of European parentage, and I hope it may be followed out. Mr. M'Ivor could now take the supervision of two or three more, say from the Male Asylum. Lads of robust health and moral conduct should be sent.

* * *

Before, closing, I venture to suggest that Mr. M'Ivor having now served the Government for nearly ten years without any increase of salary sought or proposed, might reasonably be allowed an increase so as to raise his allowance to Rs. 200 per mensem, on the express condition that he devotes his whole time unreservedly to Government service. In addition to the garden superintendence. he might be required to undertake the management of certain tree plantations in the immediate vicinity of Utakamand, to which I shall allude in a separate communication."

The following extracts from "Forestry in Southern India" by Major-General H. R. Morgan. will interest modern Foresters.

"A Forest Officer to be really useful should know first and foremost the language of the people; without this he is useless, or at best, at the mercy of intriguing interpreters; in addition to the language, the habits and customs of the people, then Arboriculture in all its branches, next Engineering and Surveying—how to build houses and bridges, survey roads, and blocks of forest, &c., run boundaries by a pickaxe trench; and mounds of earth, stones are useless; physic his people when ill, treat them with tact, attend to the health of his bullocks and elephants, and last but not least, keep his own health, answer endless letters, and understand accounts.

* * *

The best soil for a Teak plantation is a sandy clay on on the banks of a stream, the ground should slope gently towards the stream, if too steep, the soil on the top of the hill is apt to be indifferent. There are other soils such as a brown surface soil with a rather retentive sub-soil of yellow clay; in such a place Teak grows well.

* * *

For this year 1882, Teak is selling in Madras for 2-8-0 to 3-8-0 per cubic foot.

* * *

Nellumbore Teak-plantations.

Management.

Thinning.

I had since 1860 been more or less connected with these splendid plantations until I retired from the service in 1874, when working the Mudumalai Forest for the Wellington Barracks which I was engaged in building, I had occasion in 1857 to visit the Rajah of Nellumbore about forest matters, and first saw the Teak plantations then about thirteen years old; in 1860, I visited them officially and found that the 1845 plantation had never been thinned, and required to be operated upon at once. The 1843 and 44 plantations had been thinned more by failures than by the hand of man—they were poor and of no extent; but the 1845 was a very fine one, and the old Overseer Chatoo Menon could not bring himself to cut out the trees. I had to mark the trees myself and followed by half a dozen axe-men, in a week we had made a considerable gap, and the ice once broken, the old man went on thinning out under the auspices of Overseer Hall whom I sent down to assist him. This, 1845 block should have been thinned three years before the trees were crowding each other and making no progress.

Chatoo Menon.

Mr. Ferguson 1845-trees.

In 1860 I was enabled to appoint Mr. Ferguson to the charge of these important plantations, and Chatoo Menon retired on a pension which he had well earned. Here I must record how faithfully and how well this native had served the Government; connected with the Nellumbore Rajah's family, he had position, and being immediately under the orders of the Collector, he of course, derived considerable support from the Revenue authorities. From 1843 to 1860 Chatoo Menon had been incessantly engaged in planting, and had put out about a million of Teak plants on 1,200 acres. Mr. Ferguson a practical Forester, soon mastered the details of planting and pruning, and when I saw the 1845 plantation in 1872, the trees were about seventy feet high and fifty feet without a branch,—they were then nearly thirty years old, and had then over fifty cubic feet of timber in them, They have now over one hundred cubic feet in 1883.

* * * *

Col. Beddome's report on the plantations.

My report on the plantations.

Cause of disease.

Age of Teak trees on the land.

Suitable climate & soil.

With regard to the stag-headed appearance of some of the trees, I could only account for it by supposing that Colonel Beddome had seen them early in the year when perhaps some of the ends of the top-most branches had not developed their leaves, or from being struck by lightening for I could not find a single stag-headed tree. On going over the ground, I saw a number of fine Teak logs on the ground, and on enquiry was shown the stumps from which they had been cut; on examination of the logs, I counted seventy rings, and the conclusion I arrived at was that the stump was not less than one hundred and fifty years old, and might, from its healthy appearance, produce another shoot equal to what it had already done — as this was natural Teak growing close to a plantation, it became evident that the soil and climate was quite capable of producing very large trees, and that they would be healthy certainly up to one hundred and fifty years of age, and probably to two hundred and fifty years; and I have not the slightest hesitation in saying that I consider the Nellumbore Teak plantations capable of enduring for centuries.

* * *

Officers to study at Nellumbore.

In 1860 I recommended to Government that every Forest Officer should be passed through Nellumbore that he might learn practical planting on a large scale, and I believe three or four Forest Officers were sent to Nellumbore.

* * *

Burning of Teak Depot, Anamallies.

It appeared that a very large quantity of Teak leaves was driven by wind against the stack of timber and lodged there; when the forest was on fire, sparks caught the inflammable Teak leaves, and these being set a-light, communicated fire to the stack. No one found it out for two or three days; when the alarm was given, the Forest Officer was miles away, water was not available, and the huge stack of timber burnt on. It was specially fine timber, having been selected for the building of a frigate, and the loss was great. At last the Forest Officer arrived, and by means of his elephants, put out the fire by burying the ends of the logs in the ground.

* * *

On the Anamallies the elephant drags by the teeth; so they do in many parts of Malabar. It is a most pernicious practice, because it loosens the teeth, and an elephant's grinders once out of order, he has to be laid up for a long time before he recovers. I am aware that the elephants do not entirely depend on their teeth, but assist themselves by means of their trunks, still they cannot always avoid heavy jars.

Elephant's food.

The Mahouts are very fond of giving raw rice or paddy to elephants, the result is that much is stolen, and much passes through the animal undigested. To obviate this, there are two courses — one is the Burmah custom of giving baked cakes of rice, the other, the one I always pursued in the forest, was to damp the paddy for three days till it germinated exactly as barley is malted for beer. I found my elephants kept in better condition on thirty pounds of dry paddy, treated in this way than on forty pounds given unmalted. Mahouts are very fond of asking for massala for elephants and of doctoring them, some of them are skilful in curing wounds of the feet, or sores on the back and shoulders. Elephants are subject to worms, and frequently eat mud as the Mahouts phrase is "Mutteekhaia hei"—the fact is the elephant delights in a salt lick, quite as much as a deer, and should have salt in his food frequently, the Mahouts never give it if they can help it. They prefer that their elephants should be laid up for two or three days after eating mud. In wet weather elephants should have massala, and if possible be kept under cover at night.

Medicinal as well for worms.

This is natural when they eat mud.

* * *

In dragging timber, rollers are rarely used, but in some places, they are of immense use saving the elephant and rendering the transport of huge beams possible. I have seen three elephants harnessed to a log, and unable to move it, simply because rollers were not used. A powerful elephant will drag fifty cubic feet of timber over level ground, but when it comes to dragging over hills and swamps, he cannot manage more than thirty feet, and even that with difficulty.

Rollers for dragging.

* * *

It is of the utmost importance to keep your animals in good condition, unless closely supervised; the Mahout and bullock-drivers starve their animals, and the work of the forest comes to a dead lock. On the subject of saw-mills, I can only refer the reader to Major Campbell Walker's work, "Reports on Forest management in Europe." I have no faith in elaborate arrangements within the forests. The fever and other

Saw-mills.

drawbacks soon render any machinery useless. In North Canara where elaborate arrangements were made for the introduction of the sawing machinery, the Engineer, soon after arrival, died; what has happened to the scheme, I have not been able to learn, but so long ago as 1860 I was consulted about machinery driven by water-power, and I was against it for the following reasons :—

1st. Any skilled labour would be very liable to be lost through fever.

Saw-mills.

Fever and other drawbacks.

2nd. That sawing Teak, and sawing deal were two very different matters, that it was very easy for an American to go into forests with a saw in his shoulder, set up his mill in the forest, and saw away any amount of wood, having no fear of fever before his eyes, but with Teak is was different, the wood was not only very much harder that deal, but was full of oil, the hardness of wood caused the saw to buckle; the oil clogged the saw. Mr. Groves, who had a circular saw driven by water-power in the Segoor forest, was obliged to drive his saw very slowly, or he got no work done; again, on account of fever, his men were perpetually laid up, and he had to sharpen his saws himself, a very fatiguing operation, his saws buckled if he did not closely superintend the work, and to straighten a circular saw, requires some skill. It was always my opinion that the Forest Officer and his establishment had quite enough to do to work the forest in the roughest manner. Even if establishments were doubled, they will be sufficiently occupied with planting, supplying the market demands, and conservancy generally. Allowing for fever and its concomitant evils, there will never be more than one-half the establishment at work all the year round.

At one time I was very anxious to obtain a small portable saw-mill that could be set up in any part of the forests, and simply cut a beam in half longitudinally, as sometimes, I have had over thirty beams in one spot, each over, sixty cubic feet that required to be reduced before they could be got out of the forest, and was obliged to employ sawyers, as it was not possible to obtain a portable Sawing Machine. The sawyers, what with fever and advances, gave endless trouble as they worked in a set of three, if one man was ill, the other two were idle, and, of course, got into debt, and all work was at a dead lock. There are many trees in Wynaad and the Anamallies which measure over sixty cubic feet, and to cut them in half (say they are thirty feet long) is to ruin them for large spans so much required in engineering works, but this was found to be the common custom in Wynaad under the Assistants; in spite of orders to the contrary which were to keep logs up to forty cubic feet intact. A fifteen-foot log represented a cart-load, and so they cut them to that length, thus reducing the value of the timber to one-half.

Management of Teak Forests.

Wellington Barrack's-timber supply.

When I was sent up specially to build the Wellington Barracks, in 1856, I found they had no timber on hand, and could only obtain a small supply from the Anamallies with difficulty at an immense cost, for it was carted up the old Coonoor Ghat, some of the gradients of which were one in six. The estimate for the timber was six lacs or three rupees a cubic foot delivered. The Anamallies at that time were delivering all their best timber at Poonani for the Bombay Dockyard, and for which they received Rupees 3-8 the cubic foot, so it was not worthwhile to sell under that sum to the Barracks delivered at Coimbatore; the cost of the carriage from Coimbatore to Wellington never was fairly known, as dozens of bullocks died in bringing up the timber, and were not charged to it. However, the case stood thus: the estimate for the timber was three rupees, and it was costing over Rupees 4—8 the cubic foot, and even at that price only a little was to be obtained. On arrival, I found the Ootacamund Timber Market had not a log over fifteen feet, and we required a very large number over twenty-four feet for girders. Fortunately, I was able to secure a rented forest, adjoining the Wynaad Teak Belt, and by 1860 or in less than four years, delivered two-hundred thousand cubic feet of timber to the Barracks at a cost of only one rupee per cubic foot, after all charges had been paid. In working this forest, I at once introduced elephants, the Coorumbers had to be trained to fell only the largest and best trees' as they were in the habit of felling a tree that would just measure about twelve cubic feet, as they were paid by the log. I introduced the system of payment by the cubic foot, and they soon learnt the value of it; at one time they gave much trouble, every large tree was "Swami Tree," and could not be cut; even this difficulty was surmounted. Of course, on taking over a forest, worked by a native, it was necessary to re-organise the establishment, make roads, build carts, and in fact, provide for an extensive establishment. At one time ten elephants and thirty carts were at work, as time compelled us to use our utmost exertions to get out as much wood as possible, not only to expedite the building

Saving by working a a rented forest.

Re-Organization of establishment and new mode of working.

Plantations.

Stump fee.

Improved leased forest by seed sowing.

Public buildings supplied.

of the Barracks, but to take advantage of the lease which expired in a certain time. Afterwards it was renewed for ninety-nine years, and some planting was begun; but I did not persevree in it as the lessee demanded a stump fee, and the land and climate being better further west in the Government Forest of Wynaad, I planted sixty acres there. The cost of carriage, some eight miles, was a charge, but then there was no stump fee, and the Teak grew straighter and faster further west. It would be still advisable in the west of Mudumalli Forest to put in germinated seed, as this would not be a plantation, and no stump fee would be payable. Amongst the public buildings supplied from these forests in addition to the Wellington Barracks were the Lawrence Asylum, all the bridges on the new Coonoor Ghat, Court-house of Ootacamund, Bangalore Barracks, numerous bridges in Wynaad. The surplus timber was sold by auction in Mysore and Ootacamund. I may here observe that in addition to all this emergent work, I was constantly at the Barracks superintending the work, and pushing it on. To expedite matters, I had twelve sets of sawyers, and thirty carpenters at work, at Gundulpett just outside the forest; they made up doors, windows and flooring; for two years they were employed, this in addition to a numerous staff at Wellington. I merely mention this to show the amount of work that had to be got through between 1856 and 1860, though I was not in the Forest Department at this time. I was obliged to do all the work of a Forest officer in addition to my engineering duties which were heavy.

* * *

Anamallies.

After a visit to the Anamallies, in 1860, it struck me that sufficient attention had not been paid to the housing of the officers and their establishments. The situation of the buildings was in a hollow, and most depressing and unhealthy: the site was chosen because it was near the water!! and a better spot for catching fever could not well have been chosen. I selected a site on a ridge, a few miles off, close to the forest work, and where, by sinking wells, good water could be obtained. I further recommended that all the houses should be upstair ones; the sleeping rooms raised at least ten feet from the ground, as malaria rarely rises above that height Several officers and overseers had lost their health mainly due to the position of the bungalows—Colonels Michael, Hamilton and Beddome, Messrs. Gosling and Douglas and many overseers. At Nellumbore it was the same, the bungalow was in a low place, though there was a hill some three hunderd feet high a short distance off. I strongly recommended a good bungalow on the top. The difference of temperature alone in in that sweltering climate must have been at least six or seven degrees, to say nothing of a healthy breeze. Too much importance cannot be attached to the situation of the forest residence it should always have a sleeping apartment, at least ten feet aboveground.

House for forest establishment.

* * *

There are streams near Gooloor Hill in Beni, on the Survey Map, which lead into the "Nogo" river, from thence into the Cubbany River to Nungengode; these streams might be utilized for floating, especially if a large plantation of a thousand acres was made there. I planted sixty acres at Beni, and the growth of the trees was good. It is a fine site for a large plantation, the soil is good, the slopes are easy, the hills carry fine timber. Blackwood also grows well on them. As mostly all our timber had to be carted up to the Nilghris for public works, it was not thought advisable to open up, the floating capabilities of these streams, but as Madras offers such a good market for Teak and the Mysore Railway is open, it is time to look to that city for a market. The same may be said of the Anamallies and Nellumbore. The floating on the Nellumbore river should be put a stop to. I wrote some eight years ago, recommending that a steamer, towing some four or five flat twenty-ton boats similar to those in use on the Buckingham Canal, should be used. The voyage from the further parts of the plantation to the Railway Station at Beypore would not take more than ten hours, and the boats sould be towed back in the same time. The cost would certainly be less than the present charge which is about two annas a cubic foot. The present system is a most pernicious one. First, bamboos which are scarce have to be cut, and stored at a great expense of time, money and labour, and where labour is required for other work, the diverting of it, is at the expense of the plantations. Having collected the bamboos, they are made into a raft; on this the teak logs are placed, and a half flood chosen for floating—for if you float in a full flood, and your raft goes ashore, it must be taken to pieces as no power of elephants can push it off. Then the river, a narrow one, is blocked by numerous rafts, thefts of timber are common, the lashings are cut loose, the marks erased, and the owner vainly seeks the aid of the Police. The rafts frequently take three weeks to go Beypore, sometimes they are left high and dry for months; in fact the confusion is endless. A steamer and a dozen twenty-ton boats would put a stop to all thefts.

Steamer and boats.

The timber would be carried cheaply and expeditiously; the river would be always clear. If the steamer only worked for three months, carrying two hundred tons at a time or four thousand tons a month, the whole of the timber of those forests could be carried to Beypore with the greatest ease in two months. Moreover, there is, at times, a great scarcity of bamboos for floating timber. Teak, green, weighs over 60 lbs. per cubic feet and averages when dry 47 lbs. To leave it to dry in the forest, renders it liable to be stolen, as there are many private forests, and timber-stealing is very common. In 1874, when inspecting some new land, I had just bought for Government from the Amrapollium Rajah, I caught three elephants in the act of dragging some Teak across .the river in open day. It is true, they did not expect me to appear in that particular part of the forest. The Rajah of Nellumbore conplained that the Moplas dived under his rafts, moored in front of his house, cut the lashings at nights, and floated the timber away, He was advised to use chains, and he did so, and lost no more timber at his depot; but on the voyage down to Beypore, he had to pay Black Mail. So long as the Anamallies supplied timber to the Bombay Dockyard, it was floated to Ponani by river, but to send it to Beypore now, would be to compete with Nellumbore timber. For this reason it is preferable to send it to Madras where the consumption of Burma timber is very great, and the price high.

Shoots; Slips.

I am not aware that any of our forests require shoots or slips; the plan of a slip is laid down in "Reports on Forest management in Europe, by Colonel Campbell Walker." On visiting the Anamallies, in 1860, I was very much surprised to see what was called "a slip," which consisted of an inclined road about one in two, worn into large hollows. Elephants slipped the timber; when it lodged in the holes worn by rain they had to lift it out again; thus the work instead of being simple and easy, was very laborious and expensive. The slip is no longer used, as a road at an easy gradient has been made and the carting is done at one-half the cost of the slipping.

I observe that in my Forest Report for 1872, at page 62, I calculate the cost of slipping at 1.3 per cubic foot. I am certain the carting can be done for about one-half. Some years ago a number of trees on the Anamallies were girdled with a view of seasoning them standing, as was done in the Burma Forests; it was not found to answer, for, when felled, the wood was found to be brittle, to have lost all its oil, and the saw-men could not get a plank out of a log; of course, the system of girdling was abandoned. In 1862 the Admiralty sent out to India to enquire why Burma timber was so dry and brittle, whilst Malabar timber was full of oil and very tough. The papers were sent to me asking if the trees had not been tapped for oil, and I answered them to the following effect: "That Malabar timber was always left on the ground to season, lying in a horizontal position, so that all the sap and moisture was evoporated out of the log, whilst the oil remained, that the Burma timber was girdled and left standing for two years, that in consequence of this vertical position of the log, not only was all the sap drained away, but through the tubes all the oil was also drained away. That there was no reason

Seasoning Teak.

why Burma Teak should not have as much oil as Malabar Teak if treated in a similar manner.

Girdling.

The advocate of girdling in Burma stated, "That as the timber had to be floated, it was necessary to leave it girdled for two years to reduce its weight. That if the timber were felled and left lying on the ground, it would infallibly be burnt as the area of the forest is so great that they could not afford watchmen to look after the felled timber." They did not seem to be aware that their system reduced the value of the timber by 50 per cent. I am of opinion that it would have been better to have formed large depots and watched them, or to have put the timber on board flats and have towed them to the port.

Floating

As for rafting, it may do in some places like the Rhine where there is only a down traffic and a very broad river; but in many rivers, rafts interfere with the traffic, and it is a question, if there is not a saving in putting the timber on board flats and tugging them to their destination. One thing is certain that Burma timber is dry and brittle, and by no means so strong as Malabar, and the cause is the loss of oil.

In condemning rafting on certain rivers such as Nellumbore, I do not for a moment deny its utility on small streams, and on the Cubbany, and possibly other rivers where steamers cannot ply, in fact Wynaad timber cannot be got out to Mysore without floating, except by very expensive carting. In rafting it is advisable not to square the timber but to leave it round.

* * *

HABITS OF THE TEAK TREE.— It has been stated that "perfect drainage and a dry sub-soil" are absolutely necessary for the health of the Teak tree, (page 356, Brandis' and Stewart's "Forest Flora;") now I have found that the Teak delights in a moist clayey sub-soil. All over Wynaad, Anamallies, Nellumbore, it will be found that the Teak grows best in a brown surface soil, having yellow clay as a sub-soil, the powerful roots of the Teak soon procure drainage for itself. If by perfect drainage is meant that Teak will not grow well in swampy situations, then the remark is correct; but I cannot agree, as to the preference of Teak for granite soils, in fact, nearly the whole of our sub-soils consist of decomposed felspar which are decidedly clayey in their nature. It is true that at Nellumbore, the largest trees are seen on the banks of streams whose sub-soil is very free, but even then the clay predominates over sand, and the tree rejoices in a loose soil with plenty of moisture in it. Here we never find the Teak associated with bamboo, in fact, it is well known that Teak will not grow under bamboo. Wherever Teak is found with bamboo, it will at once be apparent that the Teak is older than the bamboo; Teak is found at the sea-level like Nellumbore, on the Anamallies 2,500 W., and in Wynaad up to three thousand feet growing well. Teak may be found on light and sandy soils, certainly not in Southern India. Teak does not live on humus, but on clayey sub-soils. I have known that it is not "fire and early rains" that prevent seed from germinating, but rats and spuirrels.

* * *

The white sandalwood is a native of Malabar on the hills of which it grows as a large tree. It is also found in

Coimbatore, Mysore, Canara, Salem, Madras, &c. Mysore produces the best Sandalwood, two kinds of the wood are procurable in the market both being the produce of the same tree. The white Sandalwood comprises the outer layers of wood, is hard, heavy and susceptible of a good polish. The yellow and brownish wood is obtained from the heart of the tree, and is the most valuable and best esteemed. The heart or heavier wood comes chiefly from the lower parts of the stem, is strongly scented, hard, takes a good polish, and is well adapted for carving, turning, &c., and is easily cleft. The odour is strong and enduring due to the presence of an essential oil. The scent is dependent chiefly on the soil, and the elevation at which it grows; a third kind of Sandalwood or Saunder's wood, or red Sandalwood as it is called, is met with in the market, the produce of the Pterocarpus Santalinus belonging to the natural order Leguminosæ and produces a valuable dye, and takes a fine polish.

* * *

Sandalroots parasitical.

There is another reason why sandal thrives with nurses; it is semi-parasitical being next in natural order to Loranthus, in its habit, and the roots seem to grow best on other roots—like the Orobanche the seeds of wich will not grow unless their roots can be attached to the roots of another plant.

* * *

Minerals for trees.

A chemist for the departmet is more urgently required than a botanist; One thing is almost certain, that trees require minerals to develop their special qualities more than humus or nitrogen.

* * *

Hedge row timber.

In Mysore wherever villages were distant from the forest, they cultivated hedge row timber in the shape of Neem Babul, &c., &c., It surely is no hardship that if a village has dertroyed its own small forest, it chould be made to renew it and not indent upon forest that belongs to the country, and to which they can have no possible claim.

* * *

Acacia Melanoxylon.

Introduced by Colonel Dun,

This tree was, I believe, introduced by Colonel Dun to these hills about the same time as A dealbata; there were a few in 1845 in his compounds and some in the club grounds. They were still so rare in 1851, that I remember some just planted were stolen from General Watson's ground and were traced to a private gardener where they had been brought as a peace-offering, and up to 1857 the Government charged four annas for a plant. Last year I cut down a tree in my ground that had been planted before 1845 or about thirty-eight years of age. Though it had a large hole in it from which a hive of bees had been cut out, it gave sufficient planks to board a large room 24 x 15 of excellent wood; indeed so much is this wood esteemed it Australia that furniture is largely made from it. Here, I regret to say it is mostly used for firewood, it does not burn green like A. dealbata, nor does it produce so much tar, but is yet an excellent firewood. As far as I have observed the tree seems to flower and seed all the year round. The flowers are inconspicuous, but the seed pods at times cover the tree. It is a very valuable tree. and should be cultivated more largely. It does not grow as fast as the

Its uses.

Eucalyptus nor is it so tall, but some trees that are forty years old contain at least fifty cubic feet of good timber; as a rule, it makes black heartwood in a similar manner to our Dalbergia latifolia.

* * *

When Vengay was selling in Madura at 1-8-0 per cubic foot, Teak was bringing but one rupee at Calicut. At Palghat, merchants ask now Rs. 2-12-0 per cubic foot, while at Calicut, timber (Teak) is sold by Government for 1-8-0, and at Ootacamund for two rupees per cubic foot,

* * *

Jungle-fever invariably breaks out on the thirteenth day counting from the first night of sleeping in the jungle, and if precautions are taken within the thirteenth day, such as an aperient dose followed up by five grains of quinine a day or two previous to the thirteenth day, the fever, if not averted, will be very much modified. Sleeping in musquito curtains will be found an excellent safe-guard. Natives invariably cover their faces with their cloths when sleeping which acts in the same manner, viz., by preventing the entrance of malarious gases-on the same principle as the safety lamp of Sir Humphrey Davy. The Italian Doctors have lately discoverd that in the blood of the fever patient, there are numbers of infusoria which were destroyed by the taking of quinine.

I have sometimes had as many as twenty bandymen in a row taking emetics, and all my work stopped.

* * *

I never drank jungle water; if very thirsty, in the pursuit of elephants in the hot weather, I chewed the fruit of "Nellekai" (Emblica Officinalis), a fruit which looks like a large green gooseberry in clusters on the trees. Astringent at first, it cause a flow of saliva and sweetish taste. One hot morning, in April, I was informed that a large herd of elephants had beset the cartmen and interrupted their work; everything was at a dead lock; so, to stop this state of affairs, I sallied forth at sun-rise, and an hour or two walking, brought me into the centre of the herd, numbering some sixty or seventy; by one O'clock I had run the herd to a standstill, and had slain three tuskers, the ground underfoot consisted of ashes, as the grass had been just burnt, the swallowing of these fine ashes' added to the heat of the weather, and the exertions requisite to follow the herd, were such as to create a thirst of no common kind, and yet on a bottle of tea, and two or three "Nellekais," I walked back to camp, feeling none the worse for my exertions. I have often, on the hills, in a blazing sun, in January, tried the effects of cold water from a purling stream, the more I drank, the more I desired to drink, and no amount seemed capable of quenching one's thirst; indeed I may say that weak tea, with lime juice (if it is warm so much the better), is the only drink capable of assuaging a raging thirst.

The Forest Officer has not time to train men in this Department, nor has he any appliances, whereas they may all be found in the Ootacamund gardens.

Colonel Beddome, in his Forest Report for 1869-70 page 44 mentions a small area of superb Teak, nine feet in girth and sixty to so seventy feet high.

Black wood,
Dalbergia
Latifolia

This tree attains a vast size on the Anamallies, Wynaad, and the slopes of the Nilghiris above Nellumbore, planks three feet in diameter are not uncommon; it is considered by the natives to be stronger than Teak.

* * *

Notes on Eucalyptus globulus.—This tree was planted at Ootacamund by General Fred Cotton, then Captain Cotton; about the year 1843, there was one in the ornamental sholah at Gaton then his property, and there were three trees in his woodcote.

In 1852 Mrs. Morgan drew my attention to the seeds of a tree at Colonel Havelock's house; this was a species of Eucalyptus; we raised about four hundred plants from its seed, and finding the growth extremely rapid, about ten feet a year, I was induced to obtain a quantity of Eucalyptus seed from Australia in 1856, and in a short time raised over one hundred and fifty thousand plants, and distributed them all over the hills. So rare were the plants that even in 1867 the Government Gardens priced a plant at twelve annas. In 1862 Sir William Denison, the then Governor, seeing how successfully the trees grew, ordered some Government land to be planted, and this was the commencement of planting on a large scale.

The Eucalyptus has been credited with keeping off malaria in marshy places by the aromatic scent of its leaves; this is only partly correct, for the fact is that the tree having very powerful roots, pierces through the bed of clay that retains the moisture, and thus drains marshy lands, for the water descends to a lower level. I have, on these hills, seen small ponds and streams dried up where Eucalypti have been planted. In many parts of Italy where Pinus Maritima has been planted, the ground has been completely drained, and the malaria banished. At Arcachon, in France, there was a very considerable tract of land, full of marshes, with stunted Oak, Beech and Elm growing, the place was the resort of snipe and woodcock. The trees were cut down, and the whole planted with the turpentine yielding fir, the result was that the ground was completely drained, and the place become a sanitarium for invalids. In Algiers the planting of the Eucalyptus has, in numerous cases, banished malaria by simply draining the land.

Eucalyptus Globulus.

The tree is of very great use here for ordinary building purposes, the thinnings at eight years of age makes excellent rafters and wall plates, nor do they easily decay if the bark is kept on and the wood protected. Planking from older trees lasts fairly well, if not exposed to damp, but this is no test as we have no timber so to speak; the oldest trees being only twenty-five years old, and nothing being considered timber under forty years. I may here observe that by steeping the planks in a tank of water which contains 1/600 part of lime, the durability is much increased. There is no necessity for putting more than one cubic foot of lime to six hundred cubic feet of water, as no more lime can be taken up by the water;

Of the wood as timber.

the theory is that the water forces out the sap and deposits lime in the capillary tubes.

Eucalyptus varieties.

In the year 1862 I obtained a large variety of Eucalyptus from Australia, none of the Jarrahs succeeded, it being too cold for them, but the red gum, Eucalyptus rostrata, has done well, it is reckoned a most valuable timber in Australia; it is nearly allied to Jarrahs; Eucalyptus amygdalina also grows well — this tree is reported to exceed even the Wellingtonia Gigantea in height, trees of nearly five hundred feet in height having been measured. The grain of Eucalyptus Globulus is similar to that of the Ash.

* * *

Some years ago, (Forest Report, 1861-62,) I compared the growth of the Eucalyptus with Teak at Neliumbore and Oak plantations in England, and found that Teak grows twice as fast as Oak, and Eucalyptus twice as fast as Teak.

* * *

The wood when ten years old is good for all kinds of rafters used in building; when twenty years old, it is fit for flooring planks, rafters, reepers, &c., when forty years old, it may be considered to be timber and has been used for ships, spars, &c.

* * *

One kind of tree invariably consumes all the food in its vicinity required for its special conditions. This is well exemplified in the Teak plantations at Nellumbore, where occasionally a natural Teak tree is observed to have been enclosed in the artificial Teak plantation; for a radius of thirty feet all the young Teak languishes and refuses to grow, but should a blackwood tree have been enclosed, the young Teak near it flourishes and does not exhibit any appearance of poverty.

* * *

The only possible way in which soils exhausted by koomaree cultivation can be restored is to put an entire stop to it. If the mischief has proceeded so far that reboisement is necessary it should be taken in hand at once, and the areas requiring it planted up with such descriptions of trees as suit the climate and locality, and are likely to bind the soil with their roots. For high elevations the Acacia dealbata answers excellently for this purpose. Some species of Ficus are also very good, especially those that throw out an abundance of ærial roots are suited for low elevations. It may be contended that the aboriginal tribes have practised the koomaree system of cultivation from time immemorial—that it is impossible to put a stop to it. There is considerable truth in this; but the word impossible in this instance should form no part of the Indian Forester's vocabulary. To suppress the practice will take years and years. The aboriginal tribes must be found some other means of employment. They must be civilised. Lands must be set apart for them and permanent villages built. They must be encouraged to plant fruit trees and grow other crops than those they have been accustomed to. They must be taught trades and stimulated to practise such as they engage in at present, e. g., the manufacture of pottery, of basket-work and the art of the blacksmith. Congenial employment must be found for them by the Forest Department, such as timber squaring, the collection of forest produce, &c., and deserving men should be employed as watchers, elephant-drivers and maistries. They can be made of the greatest service to the Forest Department or the reverse, as they happen to be treated; at present, they are aliens and out-castes, swindled by everybody and oppressed by every peon and policeman in the country. How can the Kurumber be expected to rise in the scale of civilisation when he dare not possess property? If he invests in a few fowls, sheep, or goats, the first peon who happens to see them will at once appropriate them to his own use. If he grows vegetables, they too will be stolen from him and the unfortunate owner most probably be made to carry them to the house of his despoiler. Dare the wretched man complain he is kicked and beaten. This picture is not over-coloured in any way. It is what actually occurs in every forest and almost every day.

The Senior and Junior Division tour.

(*November and December 1919*).

The end of October 1919 announced to the Students of the Madras Forest College that it was high time for them to put their theoretical tution into practice, and the beginning of November was very eagerly expected. The day however came when the Juniors started to Nilambur and the Seniors to Komattiyeri with their instructors. The Seniors started on the 2nd November and reached Alangayam the head-quarters of a range of that name, on the 3rd. Thanks to the arrangements made by Mr. Cornwell, the officer in charge of the Senior Dn. Camp, the students were comfortably putup in a choultry arranged for the purpose. Mr. Parthasarathy Iyengar, late student of our College, and the Range Officer, Alangayam, did all that he could to look to the comforts of the students in that out-of-the-way place. The thanks of the students and the College are due to him. The students halted there on the 4th, and were practically shown how the different range registers, especially accounts relating to timber, should be maintained. By the break of next day all the Senior Dn. students walked to Komattiyeri along the newly made "Gillman road" for 14 miles. Before this road was laid, much difficulty was felt. Now the heart of the 'Javadis' is open to all. The principles of a hill road construction and the necessity for culverts, and bridges were clearly brought home to the minds of the students. The students are thankful to Mr. Cornwell Senior Engineering Instructor, for having, very shortly, explained to them the outstanding features of construction of this road.

The first few days of our stay were rainy, then the season was anything but enjoyable. We were comfortably put up in our tents on a big maidan permanently acquired by the College for the purpose. The mornings were spent in excursions to the valuable sandal areas and the evening was spent in playing Cricket, or Foot-ball, for which we have enough space. The ground requires a few improvements. During our stay at this camp which lasted till the end of November, we studied sandal thoroughly. Its root parasitisim was examined and determined. The experiments conducted by Rao Sahib M. R. Ry., K. R. Venkatramanier avl. the D. F. O. of that division to see whether sandal is an obligatory parasite were shown to us and explained, and so far it does not seem to be an obligatory parasite but it is too soon to give any decided opinion in the matter. We were much benefited by examining the manifold experiments conducted in bamboo areas to find out among others the longivity of a.culm, the right season for filling bamboos and the distinguishing characteristics of bamboos of one, two and three years old. We were taught the principles of the "Village Forest System" which is being admirably worked here. The principal object of the system here is to protect the valuable sandal areas, ruined in the past, by securing the willing Co-operation of the Malayalee's here with unscrupulous Sandal dealers. The scheme so far has attained success here which seems to be mainly due to the sympathetic attitude of Government generally, and of Mr. Venkataramana Iyer, the D. F. O. in particular; in our history 8th November '19 is an eventful day as we had the rare fortune of being present at a 'Durbar' held by the conservator (Mr. Latham) of the southern circle at Komattiyeri when all the 'Oorans' were present to represent their grievances, and take the advice of the authorities concerned. Those who successfuly protected their forests under the "Village Forest System" were rewarded freely. The principles of the system were explained *in extenso* and at the end a group photo with the 'Oorans' were taken.

For a period of our stay here our Principal also stayed with us and was always on the look out for the progress of the students in all directions. We are thankful to Mr. T. D, Ponniah, Range Officer, in charge of Polur, a late student of the College for his very kind attention to the convenience of the students. Though the 'Javadis' are ill-reputed for fever none fell ill continuously, a few of us had one or two days fever only. After we left the Javadis we stopped for a day at Tirupattur, and studied the cleaning, stocking and booking of sandal, Mr. Manickam Pillai in charge of the Range looked to the comforts of the students and arranged for a special commodious building for their stay there for 2 days.

The students then proceeded to Nilambur, where they stopped till the 18th December '19, when they broke for Christmas. Here they had a comparative study of teak plantations of 1917, 18, & 19 and the thinned, and unthinned areas. Here they had their practical examinations for a few days.

While the seniors were thus engaged at Komattiyeri, the Juniors had their practical course of instructions at Nilambur where they were comfortably put up in the spacious compound of the Nilambur Dt. Forest office; on their way to Nilambur they stopped at Calicut for 4 days and visited the Kallai saw mills, Govt soap Factory, Henkes' tile factory, Fish canaries, and the Beypore Timber Depot. They visited the different teak plantations, and learnt about weeding and thinning. They visited the Edavanna rubber estate where they were told about the preparation of rubber from latex. Practical demonstration in foundation digging and construction of laterite walls in addition to anchoring the wire rope for a 'boom' across the Nilambur river, was given in Engineering.

When the seniors went to Nilambur the Juniors shifted their camp to Nedungayam. There, they had the opportunity of visiting a natural forest and how areas selected for teak plantations should be dealt with, most of the areas here under plantation, being first class areas; the principles of thinning them were also taught. They also built a substantial 'Trestle bridge' which the seniors saw subsequently. They too broke for Christmas about the 18th December 19.

The principal was with the college for a month at Nilambur. Messrs., Swami Kutti and Rowland spared no effort to render our stay comfortable and instructive. When we compare what we have heard of the experiences of earlier years in other districts we realise that our grateful thanks are due to these two officers and their thoughtful care.

T. M. Doraisamy Pillai,

24—2—1920.

A pleasant evening at Kargudi.

The Students of both the divisions of the Madras Forest College were 'at home' to Mrs. Cowley Brown, Principal and Staff and to Mr. Govinda Menon the E. A. C. in charge of Mudumalai Range on the evening of the 4th February at the joint camp at Kargudi. The following programme was successfully gone through. Student A. R Manuel of the Junior Division opened the function with a song which was very much appreciated. Student P. Sankunni Nair then performed 'Thought Reading' very ably which brought forth outbursts of laughter. Recitation formed the next item in the programme and T. M. Krishnamachari did full justice to his part. The anxious expectations of the guests and students were pacified when B. S. F. Lebbai of Ceylon, a Junior Division student, entered the stage with his 'Subject', A. Rama Rao of the Senior Division on a cot in Mesmeric sleep. The subject's body was lifted and placed on two chairs one of which supported his head and the other his feet. It looked as though a log was kept supported at the two ends. Weight to the extent of 150 lbs was applied on the stomach of the 'Subject' but it never yielded. Various were the wonderful items performed not excepting the one in which a pin was pierced through the skin; the 'Subject' obeyed the will of his control without hesitation and murmur. When Rama Rao was brought back to his senses many sympathatically examined his arm whether the driving of the pin left any mark and drew blood. Nothing was found. The guests congratulated the young Mesmerist on the very successful programme he went through.

During a short interval the guests were treated with light refreshments and tea. The interval was broken by a short lecture on 'Moral Philosophy' by student Parameswara Iyer. And then followed a Sindhi Song by C. K. Gulrazani which was appreciated by all. Palanikumaran amazed the whole audience by his conjuring. Many were the card tricks which he performed and the audience tried their best to defeat him. But he yielded to none and all his tricks were quite successful and bewildering. To his credit it must be said that his quickness of hand amazed and duped all. The evening programme was wound up by the enactment of a short farce entitled "Fashion of the Day" by Senior Division students Abdul Rahiman, Abdul Rahimkhan and M. P. Subbiah. It was very witty and humourus and the guests enjoyed the fun fully.

After the end of the programme our Principal congratulated the students who made the evening programme a success. He also observed that the occasion gave him a rare opportunity to learn the talents of the students and that he and his follow guests were delighted with the kindly hospitality of the Students.

T. M. DORAISAMY PILLAI.

The elephant capture in Mudumalai Range.

The experience of the 30th January 1920 will never be forgotten by the students of both the divisions of the Madras Forest College. While both the divisions were engaged in their usual morning avocations in the field, information was received at 9-30 A. M. that two elephants were got caught into pits, one a tusker of 5 or 6 years old, and the other a cow-elephant of between 1 and 2 years. Both the divisions stopped work, and were ordered to the spot 4 miles away from the camp to see the release of the elephants, so as to have first hand information. The eagerness of the students knew no bounds. All were at the spot in time. The occasion was graced by Mrs. Cowley-Brown and the cow elephant was christened after her as *Cecilia*. The tusker was named Henry after Mr. H. Tireman, the conservator of the circle, who joined the merry group when his god-child was taken for being enkraled. All the Instructors, including the Principal were there to see their rescue.

Pitting and Watching for capture of elephants :

Pits 12 to 15 feet square and from 15 to 18 feet deep with the sides almost vertical, are dug up in places resorted by elephants. In most cases, these places adjoin streams, the idea being that elephants which go for drinking water may fall into these pits. The pits are covered with mats spun out of split bamboos, and these are then camusflaged with a layer of mud and dried grass. The pit all round is so covered with grass so as to give an undisturbed appearance that the elephants may not suspect any evil. In certain places, sugarcane, kambu and cholam are cultivated around the pits to invite the elephants to the spots. Pit falls do not occur always but only during a certain part of the year known as "elephant capture season". This is a season of scarcity of fodder and water, when pits are dug up in places where the elephants are likely to go in search of them. The pits where,in our captures have fallen adjoin a stream which is said to be perennial. There is also good growth of grass all round. The number of pits dug up vary according to the locality. Here more than a score of pits were dug up and these are watched twice a day by a man specially appointed for the purpose. It so happens that other kinds of animals such as bears, samburs deer also fall. These are removed from the pit, let off, and the pits cevered as usual. When there is a pit fall of elephants information is immediately given to the Range Officer, and Jamadar who make arrangements at once for the removal of the fallen ones.

Its state in the pit:

The ferocity of an elephant when entrapped in a pit may be better imagined than described. Soon after fall, they become restless and ferocious and the state of the pit vividly shows their action. In their anxiety to escape from the pits and join the herd, from which they separated, they run this side and that, butting with their heads and tusks and legs and scratching the sides of the pits by their tusks and teeth. But of what avail are these before the ingenuity of man! They tire themselves and yell out for help, perhaps, but without any hope.

How they are noosed and taken out of the pit:

For taking an elephant out of the pit, 2 ropes, 4 tamed elephants, a lot of billets and some experienced men are necessary. The ropes are of hemp and are strong but soft. The rope for the neck-noose is about 2″ in diameter. The other for the hind leg is a little smaller. The thicker end of the big rope is folded to about a foot or more and tied strongly so as to form a loop. According to the size of the elephants' neck, a noose is formed and that it may not be tightened in the effort, and the elephant strangled thereby, a piece of wood about a foot long is passed across into the rope, and tied so as not to allow the loop to tighten. The place where this piece of wood should be tied is often learnt by experience by looking at the size of the neck of the elephant by the Jamadar. From the extreme end of the loop this guessed length is measured out and the piece of wood tied there. Another rough method to find out the circumference of the elephants' neck, is by taking it at 7/8th of the height of the elephant measured to its withers. The next thing to do is to slip the noose on the elephant's neck Its trunk is a great impediment and the elephant should be made to raise its trunks high. For this purpose a long piece of cloth is drawn before the eyes of the animal to irritate it. It is also proked from behind by means of long bamboo poles. **Infuriated at all** these jokes for which it is not prepared, the elephant raises its trunk to catch the cloth. All this time the noose is opened broadly and kept ready by 3 or 4 men and slipped on its neck, when it raises its trunk. It is very rarely that first noose catches the neck of the elephant and it is repeated till it is properly slipped. When done properly it is tightened by briskly drawing the other end of the rope and fixed to an adjacent strong tree. Then comes the securing of the hind leg. A noose, as already explained is made but without any piece of wood to prevent tightening, as no harm is caused by any amount of tightening of the leg. The noose is opened out and thrown into the pit and the elephant is poked and disturbed to move hither and thither. Its movement being watched when it perchance lets one of its hind legs into the noose, it is tightened and secured to a tree. Owing to the irritation caused, the elephant sometimes, shows signs of tiresomeness by not heeding to any poking. To refresh it, cold water is poured from above on the animal's head and back. It remains that the neck noose should be fastened securely so that it may not slip and the elephant bolt away when taken out. The animal is now within the pit and it should therefore be brought within the reach of man but not so far above that the animal may come out. Logs of wood are slowly and carefully thrown into the pit, so as not to hurt the animal and as the pit is thus made shallower and shallower, the elephant comes up and the neck and leg ropes are tightened. When it is within reach from above a man fastens the piece of wood and the loop firmly. This man lies flat on his stomache with half his body away from the edge of the pit, and a cloth passed round his stomache together with his legs, are carefully held by 3 or 4 men so as to draw him away when the elephant turns towards him. This is one of the dangerous things; and the men holding him will have to be all the more careful. After the noose is securely fastened there only remains to get the elephant out of the pit. Some more logs are thrown in and 4 tamed elephants are made to stand very near the edge of the pit to check the new one on coming out. The neck rope is taken charge of by one of the elephants and 'Jupiter' did creditable work in this and various other directions. More billets of logs are thrown in, and the captive makes an effort to reach the top. Just as it reaches the top, the neck rope is instantly taken charge of by Jupiter and the captive is out and checked from running. Two more elephants come one on each side and a third goes in front and bars its way. If the captive behaves rudely, the tamed ones butt it. It is thus again a captive in the mids of elephants.

Enkraalment.

The neck rope is passed round the belly of one of the trained elephants and properly secured; so also the hindleg rope on another elephant. One elephant leads the way and the fourth pushes the captive from behind when it makes any mischief on the way. Our *Henry* was very naughty on his way and laid down in places. After so many difficulties, it was taken to the stream for a bath and to drink water. Here again he gladly went into water but would not come out till he was forcibly pushed by the veteran jupiter. By this time a solitary cell (kraal) was made ready in the elephant camp near by and *Henry* was led into it by kamala by about 2 P. M. and the bars were carefully drawn after kamala came out. Being separated from its kind, *Henry* butted and kicked the bars around its cell, only to get injuries on the forehead, legs, and trunk. It even climbed up the crosspieces, only to fall back. After enkraaling, the neck and hind leg ropes were taken out, (rather a dangerous job) by the Jamadar Gopala Rao, whose work was indeed very commendable.

In the same way Our other Captive *Cecilia* was also taken out, brought and enkraaled, at 5-30 P. M. We are thankful to these elephants for the time chosen by them for their fall and praticularly also to Mr. Govinda Menon, the Extra Assistant Conservator, in charge for having sent us the information and waited till we reached the spot and thus given us one of the rare opportunities.

Those of us who had experience in such matters were of opinion

(i) that to ensure the safe entraction of the animal more billets should have been put into the pit.

(ii) the Elephant 'jupiter' and his mahou Chattan saved the situation by masterly combination and presence of mind.

Compare the strength of man to that of an elephant; yet man has subjected it by his ingenuity.

Camp, Kargudi. T. M. Duraiswami Pillai,

Asst. Editor 31-1-20.

Notes on some exotics.

(grown on the Nilgiris at "Downham", Mr. Oakes' property near the head of the Sigur Ghat).

Betula alnoides: a line of 5 or 6 trees grown from seed obtained from Assam. Age 10 years, Height about 40 feet, girths appeared to be from about 3' 6" to 1'2" (Eye estimate). A pretty tree.

Auraearia Excelsa. (Norfolk island pine) grown from a plant supplied by Mr. Crumbiegel, Government botainst, Baroda. This specimen was planted in 1906 and is now about 25' high.

Juglans nigra. (English Walnut.)

Quercus incana. (A Himalayan Oak), grown from an acorn sown in 1910. 2 trees of girth about 1' 8" and 1' 6" (Eye Estimate.)

Quercus Griffithi. (Himalayas) sown 1902.

A *Juglans* species from the Shan States (Burma) where it is said to grow to 6' or 8' in girth and to give a beautiful wood.

Camphora officinalis. (Japan), seedling obtained from Mr. Colin Mackenzie who planted 100 acres or so in the Wynaad near Cherambadi. Mr. Mackenzie I believe got the tree to grow allright, but manufacture of the camphor was the difficulty. The timber is good for boxes, especially for receptacles for clothes, as no insect will go near it; Camphor boxes fetch a good price. Mr. Oakes sold one lately for Rs. 25 at auction.

There is said to be a specimen of Camphora officinalis in Government House Gardens, Ooty, near the lower glass house.

(Officers trained at Dehra will recollect the fine avenue of camphor trees leading to theBotanical garden. Ed.)

Vitex littoralis. (sometimes called New Zealand Teak) A specimen sown in 1915 is now about 15' high.

Mr. Oakes who spent some time in New Zealand says it is regarded as one of the best New Zealand timbers.

Quercus suber, the cork oak of South Western France and of Spain. This tree grows allright at "Downham" but is attacked by an insect. Mr. Oakes has a specimen cut from a tree sown in 1906 and felled in 1917. The specimen is a length of the bole about 5 feet long and shows the virgin cork. Mr. Oakes would be happy to present it to the Forest College Museum, if required.

I inspected Mr. Oakes' trees at his kind invitation, to see whether the Forest Department might profitably experiment with any of the exotic tree species planted by him. Perhaps ***Vitex littoralis*** and the ***Juglans*** from the Shan states might be tried by the Department on the Nilgiris.

Possibly ***Betula alnoides*** would be worth trying along the trout streams, where shade is much required. At present the viminalis willow is being put out for this purpose.

J. H. LONGRIGG,
24 - 12 - 19.

Occasional Notes.

Mr. R. S. Troup (late Assistant Inspector-General of Forests) has been elected to the Forestry professorship at the University of Oxford.

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We are glad to note that the following names of Officers of the Forest Department appear in the New Year Honours List.

Knight Commander of the British Empire.

George Sankey Hart, Esq., C. I. E., Imperial Forest Service, Inspector General of Forests.

Commander of the British Empire.

Peter Henry Clutterbuck, Esq., C. I. E., V. D. Chief Conservator of Forests, United Provinces.

Officers of the British Empire.

Harry Richard Blandford, Esq., Deputy Conservator of Forests, Burmah.

Companion of the Indian Empire.

Robert Scott Troup, Esq., Imperial Forest Service, lately Assistant Inspector General of Forests, India.

David Alexander Thompson, Esq., Imperial Forest Service, Deputy Conservator of Forests, Bombay.

Rai Sahib.

Mian Budhi Singh, Extra Assistant Conservator of Forests, Punjaub.

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The good services rendered by M. R. Ry. G. V. Subba Rao of the Madras Forest Service, who worked as Indian Overseer and clerk under the orders of Lieut. T. Clear have also been appreciated by His Excellency the Commander-in-Chief.

* * *

The following further contributions to the Students' Club are acknowledged with thanks:—

	Rs.
An Imperial Officer	100
M. R. Ry. A. Siddha Pillai	25
,, T. G. Sankaran Nair	25
,, P. Sankunni Menon	20
,, C. T. Tiruvengadam	10
,, S. Ramachandra Ayyar	5
,, M. Subba Rao	5
Mr. H. Myers	10

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Killing Babul trees with Arsenic in the Madras Forest College Demonstration Forest. (*Continued*)

In continuation of the note on the above subject (*vide* p. 199, Vol. I, No. 4; pp. 66—67 Vol. II, No. 2; p. 38, Vol. III No 1.) the following resumé of results will be of interest.

(1). The operation should be carried out during the hot weather, when there is no fear of the interference by rain. (The minimum period required for completely killing the Babul trees experimented with during the rainy season is *11 months*, whereas the trees poisoned during the hot weather died within a minimum period of *6 months*.—p. 67 Vol. II No. 2).

(2). Poisoned trees die quicker than girdled.

(3). All the treated (poisoned, and girdled) trees coppice freely below the ring into which the poison is poured.

(4). The coppice shoots from the poisoned trees are less copious and less healthy than those from the girdled.

(5). Babul (in ***South*** India especially ?) takes a considerable period to die by poisoning. Neither girdling nor even poisoning is found capable of preventing coppice shoots. The latter, it is interesting to note, have however completely died in ***all*** the treated trees after persisting for about a year on the trees, in a more or less healthy condition.

Miscellanea.

In the Forest Service of France, there are about 600 Gazetted Officers. 87 were killed during the war.

* * *

A truly level line is a curved line, every point of which is equidistant from the Earth's Centre: *i. e.*, it is parallel to the Earth's Curvature.

A horizontal line is a straight line tangential to the Earth's Curvature.

* * *

A climber for bare walls.

The climbing organs of a species of Bignonia (Bignonia gracilis, *Lodd*; B. unguis-cati, *Linn*—Cat's Claw Trumpet Creeper) introduced from South America, and tried on the walls of the Gass Forest Museum deserve special attention. Below each node a pair of adventitious roots (similar, in function, to the adhesive discs of certain species of *Vitis*) serve as very strong holdfasts by secreting a gummy substance, which cements the Climber on to the support, however smooth the latter may be.

The leaf is a pinnate one, with only the lowermost pair of leaflets foliaceous, the remaining three being modified into *hooks* (hence, probably, the popular name of the species) which serve to further fasten the plant to the support. With the help of this climbing mechanism the plant is able to climb up a wall without any trellis, and a trial on bare walls, is being made.

G. V.

* * *

History of a stray sandal seed.

A sandal seed dropped by chance near the stone steps of the Gass Museum germinated successfully, and has managed to flourish, (and continues so) for a period of about *three years* with probably nothing but a *short length of Eupatorium hedge* hard by, as its host. It is now nearly 7 ft high with a maximum girth of 9 inches.

It is interesting to note that (1) about 5 ft length of the host hedge has now nearly died having, evidently, been robbed of a greater quantity of nourishment than the slender resources of the hedge could afford, and (2) the Sandal leaves are getting yellowish.

How not to do it.

A Forest Guard in the north of the Presidency was told to sow broad - cast 6 bags of sandal seed that had been obtained at considerable expense from the Javadis. The operation was duly reported and paid for as "completed." A little later the Conservator was inspecting that Forest and observed that there were no sings of Sandal regeneration. But on going into a temple near by he was surprised by the sight of the Forest Guard prostrate before the God and swathed up to his neck in sandal seed—the contents of the whole six bags: the Forest Guard's object doubtless was to invoke the favour of the local Deity in appeasing the possible dissatisfaction of the Ranger with a lively sense of fovours to come.

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Timber suited for Casks.

Dysoxylum glandulosum is considered the Indian Cask-timber par-excellence for the export of Cocoanut oil to Europe. In Malabar it is extensively used for manufacturing Cocoanut oil Casks.

According to the Assistant Forest Economist, the condition of sample barrels made of different timber species under test, indicated that satisfactory results may be expected from *Adina Cordifolia*, *Grewia tiliaefolia*, *Dillenia indica*, and *Odina Wodier*.

Terminalia tomentosa, and *Anogeissus latifolia* experimented with, in United Provinces are also reported to be quite suitable for the purpose. –(Extract from "Report of the Forest Research Institute" Dehra 1918—19)

List of books received for the College Library during the quarter ending December 1919.

1.	P. W. D. Code with appendices (10th edition).	1
2.	Ceylon Administration report 1918.	1
3.	United Provinces Administration report 1917—18.	1
4.	Indian Industrial Commission. Minutes of evidence 1916-17; Vols. 1 to 5 with list of witnesses.	6
5.	Proceedings of the Government of Bombay April 1919.	1
6.	Mr. Andrew's Conference with the publicity Board regarding Ceylon labour ordinance.	1
7.	Working Plan of the Ramnagar Forest Division Western Circle United Provinces.	1
8.	Working Plan of the Tikri Reserve Forest in Gouda Forest Division, Eastern Circle, United Provinces.	1
9.	Western Australia Report for the Forest Department for the year ending 30—6—19.	1
10.	Mysore Administration report for the year ending 30-6-18 with the Government review thereon.	1
11.	Indian Forest Records Vol. VII. P. III. Note on Hopea Canarensis, Hole, by R. S. Hole 1919.	1

12.	G. Huffel-Les Resources Realisables Des. Forests Allemaudis	1
13.	The out-break of the war of 1914—18 by C. Oman 1919. ...	1
14.	Proceedings of the Government of Bombay May 1919. ...	1
15.	Indian Forest Records Vol. VII Part V. Notes on the Larvæ and Life Histories of Prionine Beetles, Coleoptera, Cerambycidae Prionini	1
16.	Official guide and descriptive catalogue of the Madras Exhibition of Indian arts and industries 21—12—1917. ...	1
17.	Index of the Proceedings of the Forest Department of the Bombay Government 1918.	1
18.	War returns hand book.	1
19.	Journal of Indian Botany by P. F. Fyson., B. A., Volume 1, September 1919.	1
20.	Agricultural journal of India Vol. XIV. P. V. ...	1
21.	Administration report of the Forest Department of Nizam's Dominions for the year 1327 Fasli.	1
22.	Queen Mary's Technical School for disabled Indian soldiers.	1
23.	Bombay Natural History Journal. Vol. XXVI. No. 3. ...	1
24.	Proceedings of the Chief Conservator of Forests on the Inspection notes on East Kurnool Forests Kurnool District by H. A. Latham Esq.	1
25.	Proceedings of the Chief Conservator of Forests on the Inspection notes on South Mangalore Forests South Kanara District, by H. Tireman Esq.	1
26.	Forest Bulletin No. 39. The Construction and Calcareous opercula by Longicorn Larvæ of the group Cerambycidi by C. F. C. Beeson M. A., I. F. S.	1
27.	Progress Report of the Forest Research Institute for the year 1918—19.	1
28.	Monthly Rainfall of India for 1918.	1

Contributions to the Gass Museum.

Serial No.	Contribution.	Contributor.
1	Three specimens of teak rafters attacked by Carpenter bees.	M. R. Ry. S. Shanmuga Kumaran Pillai. R. O. Ayyalur
2	Crude resin of *Hopea Odorata*?	M. R. Ry, N. Gopala Nair. R. O. Begur Range North Malabar.
3	Six samples of 3 - ply Veneer boards.	The Surma Valley Saw Mills Ltd., Calcutta.
4	A four-month old "Stumped" teak plant.	H. Tireman Esq. Conservator of Forests.
5	Photo of a Tali Palm.	Chief Conservator of Forests Bombay.
6	One long and one short panel of Red Sanders.	M. R. Ry. S. Ramachandrier H. R. Hons.
7	An iron weight bearing the initials of the H. East India Company.	C. M. Hodson Esq. Conservator of Forests.
8	Fifteen samples of Tinnevelly mats.	Mr. R. E. Lemos M. R. Hons. R. O. Ambasamudram.
9	Fungus on Anogeissus latifolia	M. B. Subbiah Student Sinior Division M. F. C.

Advertisements.

The following is a list of timber species required for the Gass Museum. Such of them as are procurable may be sent to the Principal *together with botanical specimens pertaining to each species and a sample of bark about 8″ square.*

The long panels should be as broad as is available, 6 ft. long and 3″ thick. The short panels 2 ft. long and 1″ thick (breadth, maximum available).

Aglaia Roxburghiana.
Aquilaria Agallocha
Adina cordifolia.
Artocarpus integrifolia.
Albizzia procera.
Albizzia stipulata.
Acacia dealbata.
Acrocarpus fraxinifolius.
Berrya ammonilla.
Chickrassia tabularis.
Carallia integerrima.
Dillienia indica.
Dillienia pentagyna.
Dysoxylon malabaricum.
Diospyros tomentosa.
Diospyros paniculata.
Diospyros ebenum.
Dalbergia sissoo.
Erythroxylon monogynum.
Gmelina arborea.
Gluta travancorica.
Grewia asiatica.
Hardwickia pinnata.
Hardwickia binata.
Holoptelea integrifolia.
Hydnocarpus Wightiana.
Hereteria papilio.
Litsaea zeylanica.
Machilus macrantha.
Premna tomentosa.
Sterculia fœtida.
Sterculia villosa.
Sterculia guttata.
Stereospermum chelonoides.
Stephegyne parvifolia.
Tetrameles nudiflora.

The following numbers of the 'Indian Forester' are required for the *Students'* Library, The Principal will be glad to receive any that officers can spare :—

1. Volume 1, 2 and 3 for 1875—76, 1876—77; and 1877 —78.
2. Volume 6 for 1880—81.
3. Volume 14 for 1888—January, February, March, April, September, October, and December numbers.
4. Volume 15, 16, for 1889 and 1890.
5. Volume 18 for 1892 August, September, October, November.
6. Volume 19 for 1893 February number.
7. Volume 20 for 1894—July and August numbers.
8. Volume 21 for 1895.
9. Volume 24 for 1898—March and April numbers.
10. Volume 25 for 1899—April, May, June and August, September, October, and December numbers.
11. Volume 26 for 1900—August number.
12. Volume 34 for the year 1908—July number.
13. Volume 36 for the year 1910—August number.
14. Volume 39 for the year 1913—January, April, September and October Nos.
15. Volume 44 for the year 1918—March number.

WANTED.

A copy in good condition of "Hume and Marshall's Duck" with coloured plates intact. Apply stating price to the :—

PRINCIPAL, MADRAS FOREST COLLEGE,
Coimbatore, Lawley Road, P. O.

WANTED.

For the Library a copy (mounted if possible) of the June 1916 College Group.

Rs. 2—4—0 will be paid for it.

Madras Forest College, Coimbatore. } F. L. C. Cowley-Brown, *Principal.*

* * *

Indian Forester Prize 1920.

The subject for the above Prize for the current year will be:— *Subject for Present Students*:

"Fire Protection and its difficulties: Should it vary with local conditions and species? The best methods?"

Special emphasis should be laid on concrete examples taken from actual experience.

The Prize is open to all present students of the College. A prize for an Essay on a different subject has also been allotted for all past Madras Forest College Students.

No award for either prize will be made unless a satisfactory standard is reached.

The Essays should be clearly written or typed *on one side of the paper only* and must reach the Principal not later than 1st June 1920. Essays should not exceed 2000 words: in a previous year a student was disqualified for infringing this rule. Each Essay must bear a motto: the motto is also to be written on a sealed envelope containing the name of the competitor: the name of the competitor *is not to be written on the Essay.* Each Essay must be the bonafide unaided work of the Competitor submitting it.

* * *

A prize allotted from the "Indian Forester" Fund will be awarded to the past student of the Madras Forest College who submits the best Essay (limited to 2000 words) on the following subject :—

"Nature is the Sylviculturist's best guide."

No award will be made unless a satisfactory standard is reached.

The Essays should be clearly written or typed *on one side of the paper only*, and must reach the Principal, Madras Forest College not later than 1st June 1920.

Each Essay must bear a motto: the motto is also to be written on a sealed envelope containing the name of the competitor and a statement to the effect that the essay is his bonafide unaided work; the name of the competitor *is not to be written on the essay.*

Gazette Notifications.

DECEMBER 2nd 1919.

The privilege leave granted to M. R. Ry. S. Chidambara Ayyar, Ranger IV grade, S. Cuddapah dt. is further extended by one month and one day.

M. R. Ry. A. Vyasalu Ranger in charge of Kudligi Range, Bellary dt. is granted privilege leave for 20 days.

M. R. Ry. M. P. Halasyanatha Ayyar, Forester, II grade, Bellary dt. is promoted to act as Ranger, VII grade and posted to Kudligi Range of the same dt.

Consequent on the transfer of Rangers Shanmuga Kumaran Pillai, and Sankaran Nair from this district, the following arrangements are ordered :—

Mr. P. Velayutha Nayar, R. O. Sholavandan, to be R. O. Ayyalur.

Ranger Ramasamier, on special duty in Cumbum range, will be in charge of Nattam Range *vice* Mr. Sankaran Nayar. Mr. Thayuman will proceed at once to Nattam.

(1) M. R. Ry. A. K. Anantaramier Ranger VII grade is posted to Gudiyattam range, North Vellore Dn *vice* C. D. Parthasarathy Chetty granted leave.

(2) Posting of M. R. Ry. G. Devanayagam Naidu, Ranger V grade to Gudiyattam range is cancelled and he will continue on special duty in West Vellore Dn. (Nellivasal.)

(3) Mr. R. E. Lemos, Ranger II grade is posted to Ambasamudram range on termination of his Special duty, from 6th December 1919.

(4) Syed Munavar Sahib, Ranger V grade to take charge of Dharmapuri Range on relief by Ranger R. E. Lemos.

(5) Mr. B. R. Salisbury Ranger III grade granted 6 weeks' privilege leave, from date of relief by No. (4),

(1) Mr. L. J. Taylor, Ranger III grade in charge of Santavasal Range, S. Vellore, granted privilege leave for 3 months from 3rd Jan. 1920, with permission to prefix the Christmas holidaas.

(2) Mr. P. B. Sayid Yahia, Ranger VI grade will relieve No. (1) and hold charge of the range until further orders.

Mr. A. Nicholas, Ranger IV grade Tunacadavu Range granted 2 months' privilege leave with effect from date of relief.

M. R. Ry. T. G. Sankaran Nayar Ranger III grade, posted to Tunacadavu Range, S. Coimbatore dt.

DECEMBER 16th 1919.

Mr. H. F. A. Wood, conservator of Forests III grade, to act as consr II grade, from 1st June 1919 upto, and including 26th July 1919 *vice* Mr. H. B. Bryant on furlough.

(1) Mr. P. M. Mathew, R. O. VI grade in charge of Sanipaya range, W Cuddapah dt. granted privilege leave for one month with permission to prefix Christmas holidays thereto.

(2) M. R. Ry. J. M. Abraham, R. O. IV grade in charge of Vempalle range W. Cuddapah Dt. posted to charge of Sanipaya range in addition to his own *vice* No. (1) on leave.

M. R. Ry. P. Ramunni Menon Ranger III grade Ganjam, is appointed as as Senior Instructor of the 1920 Session of the V. T. S.

DECEMBER 23rd 1919.

Mr. I. John and M. R. Ry. V. Jaganatham Pillai transferred to Western Circle.

M. R. Ry. C. N. Narasimhachari transferred to Bellary Range.

M. R. Ry. V. S. Rangasamy Naickar, Forester I grade promoted to act as Ranger VII *vice* ranger M. R Ry. S. Chinnadorai Pillai appointed as Senior Instructor, V. T. S.

M. R. Ry. A. Rama Hebbar transfered to Parlakimedi Maliahs.

M. R. Ry. C. G. Krishnan, R. O. Nugur, transferred to Bandar range.

S. F. Lobo Forester I grade, S. Salem division appointed Ranger VII grade and transferred to W. circle, Coimbatore.

M. R. Ry. K. S. Ramiah, R. O. V grade granted privilege leave for 1 month and 17 days.

Mr. T. I. Chakko III grade transferred to Nilghiris for Mudumalai range.

M. R. Ry. P. Govinda Menon avl, posted to S. Malabar for duty under D. F. O.

M. R. Ry. L. S. Krishnan avl, to C. Coimbatore.

Mr. S. F. Lobo posted to Sullia for duty under the Forest Research Officer.

M. R. Ry. P. Govinda Menon, on relief by Mr. Chakko transferred to C. Coimbatore Dn. for special duty.

This cancels his pesting to S. Malabar and M. R. Ry. L. S. Krishnan's transfer.

JANUARY 6th 1920.

Mr. C. E. C. Fischer, Dy. Conservator of Forests on leave, is granted extension of furlough without medical certificate for one month from 4th April '20

M. R. Ry. C. M. Belliappa avl. B. A. appointed instructor V. T. S N. Salem Dn.

T. Kesavalu Naidu, Forester I grade appointed Assistant instructor V. T. S. N. Salem Dn.

A. M. Sreenivasulu Naidu transferred to N. Salem, for Denkanikota range.

M. R. Ry. T. S. Narayanasami Chetti, R. O. Sidhout range, granted privilege leave for 20 days.

20th JANUARY 1920.

The Six week's privilege leave granted to Mr. R. B. Salisbury, R. O. III grade from 9th Dec. 1919, is extended until 9th February 1920.

M. R. Ry. C. M. Narayanan, R. O. IV grade, on return from leave, posted to S. Mangalore Dn. for special duty in removing logs buried in the Paishwami river.

M. R. Ry. C Karunakara Menon appointed Assistant Instructor, V. T. S. 1920 Session, C. Coimbatore Division.

M. R. Ry. K. Karunakara Nambiar, N. Mangalore Dn. will be for the present in charge of Sankaranarayana range in addition to his own duties.

27th JANUARY 1920.

Mr. F. X. Mascarenhas, combined leave for 3 months from 12th July 1919.

Mr. J. S. Scot permitted to return to day.

M. R. Ry. C. N. Narasimhachari posted to kudligi Range.

Temporary ranger P. K. Kuttappan Pillai transferred to Chittoor dt. for charge of Chandragiri Range.

M. R. Ry. A. Bhaviah, Chamala range, granted privilege leave for 3 months.

M. R. Ry P. Mathuramuthu Pillai granted extension of leave to 2—2—20.

M. R. Ry. A. Raju Nayakar avl. to be D. F. O. S Salem *vice* M. R. Ry. Rai Sahib E. C. M. Mascarenhas (retired.)

Muhammad Habibullah Sahib Bahadur to be special Forest Officer, Parlakimedi Maliahs, Ganjam Dt.

Mr. F. A. Seager to be D. F. O. L. Godaveri.

Mr. H. W. A. Gaudoin to be D. F. O S. Kurnool.

Mr. C. C. Wilson, on return from leave to be Imperial Instructor at the Madras Forest College Coimbatore.

Saiyid Abdul Qadir Sahib Bahadur on relief by Mr. C. C. Wilson to be D. F. O. S. Vellore, *vice* M. R. Ry. Rao Sahib K. R. Venkataramana Ayyar avl. on other duty.

Mr. R. D. Richmond promoted to act as Conservator *vice* Mr. H. A. Latham (granted leave) without prejudice to his duties as Asst. Inspector-general, and he will be seconded as conservator.

Mr. B. F. Rigold to act as Conservator of Forests, *vice* Mr. R. D. Richmond (seconded) and to be Conservator, S. Circle in relief of Mr. Latham.

Mr. G. C. Robinson, D. F. O. S. Malabar to be in charge of the Nilghiri division in addition to his own duties.

Mr. J. S. Scot, to be D. F. O. S. Coimbatore *vice* Mr. A. Wimbush (granted leave).

M. R. Ry. C. R. Regunathan, R. O. Perambalur granted privilege leave for 2 months from date of relief by ranger P. Mathuramuthu Pillai.

M. R. Ry. R. Gurusamier posted to Mudumalai Range.

M. R. Ry. V. Jeganatham Pillai, posted to Nilgiris to assist the R. O. with the fuel supply.

M. R. Ry. S. Chidambara Ayyar posted to Bolampatti Range.

M. R. Ry. M. Rama Rao Kini transferred to N. Coimbatore to be on special duty under the orders of the Satyamangalam Range Officer in connection with the construction of the Willingdon Forest Rest-House.

Mr. T. I. Chakko granted combined leave for 3 months.

(1) Mr. H. A. Latham, Conservator of Forests, privilege leave for 5 months and 10 days and furlongh for 3 months and 5 days.

(2) Mr. A. Wimbush, privilege leave for 4 months and 22 days and furlongh for 7 months and 8 days.

(3) Mr. D. T. Barry, privilege leave for 4 months and 4 days and furlough for 2 months and 26 days.

(4) Mr. A. B. Jackson, acting Conservator of Forests privilege leave for 6 months and furlough for 3 months.

(5) Ma T. A. Whitehead, privilege leave for 3 months and 20 days and furlough for 8 months and 10 days.

(6) Mr. H. Tireman, Acting Conservator of Forests privilege leave for 4 months and 11 days and furlough for 3 months.

Subject to the approval of the Secretary of State the Government sanction the re-employment of Messrs. C. Du Pre Thornton, and A. W. Lushington and appoint them District Forest officers, North Coimbatore. and Vizagapatam respectively.

M. R. Ry Rai Sahib E C. M. Mascarenhas Avl. privilege leave upto 22nd February 1920 With effect from the date of relief.

M. R. Ry. E. B. Ramachandra Rav Avl. D. F. O. N. Salem to be in charge of the S. Salem Forest Division in addition to his own duties until he is relieved by M. R. Ry. A. Raja Nayakkar Avl.

(1) Mr. S. M. Razvi Sahib granted privilege, leave for 23 days from 12-1-20.

(2) Mr. H. McBride, R. O. Sriperumbudur Range, posted to Sathyavedu Range, *vice*, No. (1).

M. R. Ry. T. S. Narayanasami Chetty (M. R. L.) appointed to act of Ranger VII grade in the arrangement of M. R. Ry. V. N. Seshagiri Rao avl B. A., Ranger I grade on other duty as probationary E. A. C.

Service order relating to the transfer of Ranger I. John to the Western Circle is cancelled.

M. R. Ry. S. Chidambara Ayyar transferred to Western Circle in place of I. John.

M. R. Ry. C. N. Narasimhachari on relief by M. R. Ry. A. Vyasulu transferred to Cuddapah Range.

FEBRUARY 24TH 1920.

Mr. J. S. Scot, Dy. Conservator of Forests, granted an extension of furlough for one month and 5 days.

Captain W. G. Dyson, M. C. B. Sc. Assistant Conservator transferred from S. Coimbatore division and is attached to the Direction Office, Western Circle, with effect from 16th February 1920.

The combined leave for nine months from 27th March 1919 granted to Md. A. Ghatala Sahib, R. O. V grade, Kurnool East Division is extended by six months.

St. George's Homes, Kodaikanal.

For Orphan, Destitute and Necessitous
Children of British Descent.

PRESIDENT:
H. E. THE GOVERNOR OF MADRAS.

Chairman of the Board of Management:
The Hon'ble Sir Alexander Cardew, K. C. S. I.

The ultimate aim is to provide for a tithe of the 10,000 children of British Descent in India who are of school-going age, and yet are not attending any school. The area from which the Homes will receive children is from Bombay across to Ganjam and Southwards including Ceylon. The method of training is unique in South India. The children do not live in one large institution, but in separate Cottages. The stamp of charity is rigourously excluded. A "Home" is the motto. The school and Cottage staff are entirely from Great Britain. No Indian servants are permitted in the Cottage, all the work being done by the children under the supervision, and with the co-operation of the "house mother" and her assistant. A teacher also resides in each Cottage. We wish to teach the children the dignity of labour, and the indignity of unnecessary service. Technical Industrial and Agricultural training will also be included in the curriculum when the homes are transferred to their own buildings on the Nilgiris.

Rs. 35,000 are now annually required to meet recurring expenditnre.

This sum must be raised from voluntary gifts in India and Great Britain.

Donations, Gifts of Clothing, Books, Furniture, Toys, etc., may be sent to

THE REV. J. BREEDEN,
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THE MAGAZINE
OF THE
Madras Forest College.
Published Quarterly.

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Subscriptions per annum Re. 1/- and an entrance donation of Rs. 2/- for students of the College.

Rangers and Deputy Rangers etc.,—same terms as students. Assistant and Extra Assistant Conservators—Entrance donation of Rs. 5/- and an annual subscription of Re. 1/-.

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It is not intended that the Journal should be run at a profit, so that as our subscribers increase the Journal will be issued in a more attractive form. Illustrations, will then be possible.

It is the aim of the management to run the magazine for the Ranger-class (including Deputy Rangers) and mainly by their contributions. Correspondents are needed to supply suitable matter to maintain the magazine on these lines. We feel confident that this appeal will not go in vain. There must be a number of our readers who have something of interest to write on.

Complaints regarding non-receipt of the Magazine to be addressed to the Principal.

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